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EDGE

Sony ■ Sega ■ Nintendo ■ 3DO ■ PC ■ Amiga ■ Atari ■ SNK ■ Arcade ■ NEC ■ CD-i

M2

3DO's covert operation exposed

Issue **twenty-two** **22**

Voted **Magazine of the year**

IMN

Industry awards

M2 is The 3DO Company's plan of attack for the coming hardware war. Plugging into the existing 3DO, it will take 3D graphics performance to new levels of realism. Turn to page 54 for the latest intelligence on 3DO's secret weapon

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EDGE



A bright future for the U64… Curtains for the SNES?

Even though the Ultra 64 will now not be appearing at E³ (see page 6), interest in Nintendo's legendary 64bit machine continues to grow. It may not exist yet, but the Ultra 64 is now Nintendo's flagship system, on which the firm's future depends.

But what of the SNES – one of the best games machines ever produced? When the SNES appeared, it brought with it a clutch of the finest games ever to grace a TV screen. *Super Mario World*, *Pilotwings*, *F-Zero*, *Zelda III* and *Super Probotector* showed what the little beige box was capable of. Everything pointed to a long and healthy future for the SNES.

And then nothing happened. No-one else really seemed to be able (or cared enough) to get to grips with the machine. The wonders of Mode 7 visuals remained the sole preserve of spinning logos, whirling bosses and the occasional special effect. Likewise, many of the graphical weapons in the SNES armoury were simply ignored.

Admittedly, there have been frequent highs – *Street Fighter II*, *Super Mario Kart*, *Starfox*, *Bomber Man*, *Secret Of Mana* and so on – but for the most part (and for most of the US-sourced games), the SNES has been reduced to a sprites and scrolling engine, destined to glide the player along to a predictable encounter with some huge multi-limbed creature.

Only now, as the death knell for the SNES rings in the ears of publisher and retailers, does Nintendo deign to give the world *Donkey Kong Country 2* and *Killer Instinct*. The SNES deserved better.

The **future** is almost here…

inside EDGE issue 22

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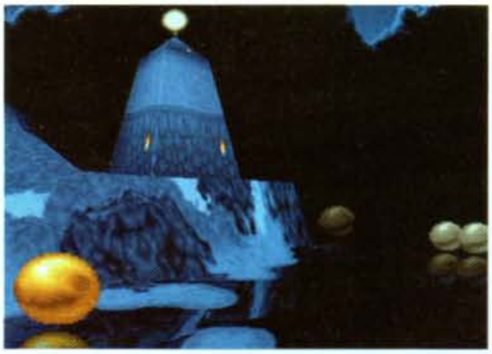






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insideview

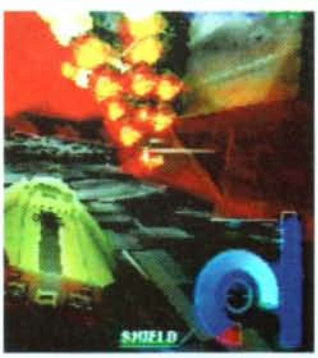
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Jaguar 2000 (left) and Nintendo's Virtual Boy

23 Prescreen



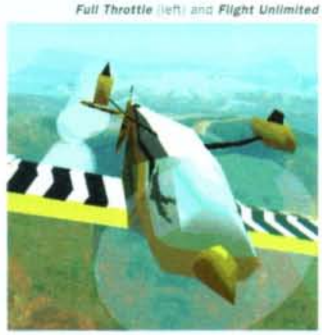


Gran Chaser (left) and Duke Nukem 3D

61 Testscreen

Full Throttle (left) and Flight Unlimited





90 John Edelson



Photography: Jude Edginton

Cutting **Edge**

The latest **news** from the world of interactive entertainment

Problems dog **Ultra 64** as schedule slips

Nintendo has admitted that its 64bit machine will not now be available this year



NCL's engineers, based at the company's Kyoto HQ (above), have still not produced a finished Ultra 64 system

Nintendo's Ultra 64 programme has suffered a setback that will delay its introduction in the United States and Japan by a further six months. Just as **Edge** 22 went to press, news broke in the US that Nintendo plans to hold back on the release of its 64bit console to give licensed developers more time to complete software projects.

The story was first aired on the front page of *The Wall Street Journal*. This was followed by an official NOA press release in which chairman **Howard Lincoln** confirmed the six-month delay, admitting that the machine would miss this year's crucial Christmas sales season and would not arrive in the US and Europe until April 1996.

'We have made a conscious decision not to rush the Nintendo Ultra 64 to market,' claimed Lincoln. 'Instead, we have decided to give our software developers additional time to maximise the power of this system in their game creation.'

It's no secret that Nintendo has had difficulties keeping its Ultra 64 programme up to speed. Until recently, developers have had to cope with an ambiguous Onyx-based development environment, and it's thought that few companies would have been in a position to introduce titles in time for the intended release date of November 21 (disclosed in **Edge** 21). The result is that Nintendo has had a dramatic rethink, which means that software companies now have a 12-month window for initial titles to be completed.



The finished Ultra 64 unit has a matt-black casing, features four joypad ports and uses a cartridge format similar to that of the SNES



Rare's **Tim Stamper** provided an official comment on the Nintendo announcement: 'As the developer perhaps most experienced with Nintendo Ultra 64, we fully support this new release schedule. We have again clearly raised the software standard with new 16bit games to be unveiled at E³. But I can →





***Killer Instinct* (arcade version, inset) will appear on the SNES in August (main). The Ultra 64, which was intended to receive it first, will instead get an enhanced version of Rare's one-on-one beat 'em up**

Rare ties the knot with Nintendo

Nintendo has purchased a 25% stake in UK-based developer Rare, the team behind *Donkey Kong Country* and *Killer Instinct* and a valuable partner in the development strategy for the Ultra 64.

The deal stipulates that Rare's future output be exclusive to Nintendo machines, and that the Warwickshire-based development house – called Ultimate Play The Game in the 1980s – produce games for the entire range of Nintendo hardware, including the Virtual Boy.

Rare has been on a recruitment drive over the past six months, and is looking to expand in-house personnel numbers from 84 to over 250 in the next two years. A standalone publishing label, Rareware, is also due to be launched during the same period.

Neither Nintendo nor Rare is willing to talk figures, but Howard Lincoln (now a member of Rare's four-man board) did tell industry paper *CTW*: 'It didn't come cheap.' Suffice it to say that the Japanese giant will have handed over millions to buy into a company without whose talents its sales figures would be telling a markedly different story today.

→ assure you that once the world's videogames developers spend time exploring the power of this incredible Ultra 64 chipset, you'll see games jump far beyond anything that exists on any platform.'

The Ultra 64 will be unveiled first in Japan at Nintendo's Shoshinkai Exhibition, to be held at Tokyo's Makuhari Messe venue on November 24-26. It will then be on show six weeks later at the January CES in Las Vegas. While no official date has yet been set for the Japanese launch, it seems likely that it will slightly precede or coincide with the US and European releases, in keeping with the tradition set by Nintendo and most other Japanese hardware companies.

Speculation about the underlying reasons for the delay is already rife among industry watchers. Although a lack of thirdparty launch software in general was a crucial factor, of more specific concern to Nintendo was the fact that thoroughbred Japanese titles would not have been ready in time – thus depriving the company of the element that has provided all its past launch successes. It's now known that Nintendo chairman Hiroshi Yamauchi was not prepared to let the release go ahead without a solid foundation of quality NCL-developed software, and even veteran game creator Shigeru Miyamoto was rumoured to be strongly in favour of delaying the system so that his own projects would form part of the Ultra 64 spearhead.

The change of plan has had a dramatic impact on Nintendo's strategy for the E³ show (which is due to take place just days after this issue of **Edge** goes to press). What was originally planned as the first hands-on test of the system itself has now been reduced to an advance look at the design of the U64 box (all black, and with four joypad ports). No games will be on display, and showgoers will no doubt be bitterly disappointed that yet another major US event has failed to deliver anything concrete on Nintendo's system.

However, Nintendo has once again devised an escape route to enable it to retain some credibility at E³. Echoing the hit 'em hard punch of its *Donkey Kong Country* launch in Chicago last summer (**Edge** 12), NOA will once again be counting on its Warwickshire stalwart Rare to rekindle faith in the SNES. As well as a much-anticipated sequel to *DKC* – this time in the form of *Diddy Kong's Quest*, complete with graphic effects that well surpass the visual allure of the first game – there's a SNES version of the previously Ultra 64-only *Killer Instinct*, which Nintendo is hoping will cause the biggest splash. Due for release in August on a 32Mbit cart (including SA-1 decompression chip), the game will feature 512 colours onscreen simultaneously (twice what is normally possible), replicating the graphics of the arcade version with surprising accuracy.



Lacking any Ultra 64 software to show at E³, Nintendo is focusing on 16bit software like *Donkey Kong Country 2: Diddy Kong's Quest* (SNES)

As Nintendo loyalists wave goodbye to the prospect of owning an Ultra 64 this Christmas, and Nintendo itself misses what could be one of the most important buying seasons the videogames industry has ever seen, the motives of the Japanese giant once again come under the spotlight. However, as Sega (with brand loyalty and market share intact) and Sony prepare to introduce new hardware in the US this autumn, Nintendo will be busy developing software that could show the Ultra 64 to be a whole generation ahead of its CD-based competition. Now all eyes will be on Tokyo in November…

What is it?

This man started (and apparently finished) his programming career on the Sinclair Spectrum. After coding two massive sellers for the machine, he became one of the most respected names in UK games development

Virtual Boy: Nintendo names the day

The *Mario* co decides on a summer launch for its VR console

it is...

Mathew Smith, the one-person team behind *Manic Miner* and *Jet Set Willy* – two classic games credited with developing the platform game genre. However, nothing followed, and his whereabouts are currently unknown...

Nintendo has set a new release date for its Virtual Boy handheld console. The 32bit 'VR' machine, which uses reflective LED technology to generate its 3D display, has had its April launch slot pushed back due to software delays and will now go onsale July 21.



The price has also changed. Virtual Boy will now retail at ¥15,000 in Japan, down from a planned ¥19,800 – a reduction effected by NCL in order to reach a wider userbase. The company is standing by its prediction of retail sales of three million units in the first year, and has confirmed that at least four software titles will be available at launch.

Games confirmed by Nintendo are *Teleroboxer*, a robotic boxing title similar in style to the *Punch Out!* series; *Galactic Pinball*, featuring five different pintables; *Mario Clash*, a platformer retaining many familiar *Mario* elements but with the opportunity to move 'in' and 'out' of the screen (it's perhaps the most promising title, having been designed in part by Shigeru Miyamoto); *Mario's Dream Tennis*, a sports game featuring characters from *Mario* lore as players; and *Red Alarm*, a wireframe polygon shoot 'em up developed by T&E Soft, boasting 'gameplay similar to *Starfox*'.

Four other projects are in progress, but are further from release. Two are from Nintendo – *Mario Bros VB* and a *Pole Position*-style racer – and two from Hudson Soft – a vertically scrolling shoot 'em up and a puzzle game in the style of *Tetris/Puyo Puyo*.

Thirdparty licensees working on the system include such major names as Namco, Virgin and Takara. Konami, Capcom and Square Soft – three of Nintendo's most valuable thirdparty allies in recent years – are playing it safe at present, having yet to decide on the system's potential.

There has been concern in Japan over the marketing strategy for the machine (is Nintendo's latest venture really a next-generation console or merely a high-tech toy?) but it has now gained retail support, with many of Japan's leading toy stores and software chains agreeing to push it come July.

The US launch, meanwhile, is set for August 14 at a price of $180. Nintendo UK has yet to decide on British release details.







From top: Hudson Soft's as yet untitled shoot 'em up allows flying 'behind' the scenery; the obligatory puzzle game (no name yet), also from Hudson; T&E Soft's *Starfox*-inspired *Red Alarm*

Attract mode

LucasArts' *Full Throttle* (reviewed on page 68) can trace its line of descent back to those seminal graphical adventures *The Secret Of Monkey Island*, *Day Of The Tentacle* and *Sam And Max Hit The Road*. Attract Mode singles out the game's wonderfully cinematic intro for special attention



1 The opening scene. The camera tilts down into a sandstone canyon to reveal a deserted road snaking along the valley floor. A ghostly wind whistles across the landscape



2 A hovercar speeds along the road a few feet above the shimmering asphalt. The rocky walls of the canyon rise steeply on either side. Cotton-wool clouds scud across the sky



3 Interior shot. Corley (left) and the evil Rittburger, the two businessmen who head the last motorcycle manufacturer still in existence, discuss their plans to keep the firm afloat

Sega gets head start over Sony in US

Saturn now has a chance to establish an early lead in the American market



Sega's new-look black Saturn, with redesigned joypad, is set to hit American shores earlier than was originally planned. Sega's US headquarters (below right)

Sega is set to bring forward the Saturn's US release date from September in a surprise announcement at the E³ show in Los Angeles. June or July – July 23 has been predicted by one source – will see the Japanese videogames giant roll out its redesigned 32bit console to a market it believes is now ready to mass-consume its flagship machine.

Sony's PlayStation, which has generally enjoyed more favourable press than the Saturn, is still scheduled for September, and SOA president Tom Kalinske will be looking to deliver a significant blow to the company he sees as Sega's major competitor. Moreover, the decision will further endear Sega to a continent predominantly bred on the Genesis, its most significant consumer success.

Numerous pack-in deals are possible, with *Virtua Fighter* and *Panzer Dragoon* – two of the Saturn's most immediately appealing titles – likely to be bundled with the machine. The inclusion of some form of demo sampler CD (perhaps similar in style to Sony's *Demo Demo* PlayStation series) is also under consideration.

The machine looks set to fall within the $350-380 price range, although fluctuating exchange rates (the strength of the yen is causing Japanese firms severe problems at the moment) could yet lead to a revision of that figure. Whatever the final cost of the Saturn, consumers are sure to benefit from a reduction in Genesis and 32X hardware following the launch of Sega's next-generation system.





Nintendo's Satellaview system (see Edge 19) went live in Japan on April 24.

The hardware, which costs ¥18,000 (£130) and plugs into a Super Famicom, allows users to access satellite broadcasts and download SFC software.

Faced with a front-end in the style of a cartoony Japanese city (above), the user can wander freely between buildings, which represent various services.

As well as original software and previews of forthcoming games, it is claimed that Satellaview will soon offer the facility to expand normal cartridge games with extra data. How the system will coordinate such a feat, however, is not yet known.



4 Suddenly, the hovercar is jolted violently from behind. A huge motorcycle leaps off the roof and hurtles along the bonnet, crushing the Eros figurehead in its path



5 The culprits roar off into the distance. This is your first encounter with the Polecats, a gang of renegade bikers. The souped-up machines mark their superiority in the biker wars



6 An exhilarated Corley leans out of the window, his white hair streaming in the wind. Remembering the good old days, he grins like an excited child as he watches the bikes disappear



7 The titles appear over a shot of the game's hero cruising the highways, an outlaw in a lawless society. The rumble of the bikes' engines dominates the soundtrack. Game on...

M2 another step closer to reality

Work on 3DO's second machine has now reached a crucial stage



3DO CEO Trip Hawkins is steering his company into a new era of hardware performance

The 3DO Company has officially unveiled its M2 strategy to the games industry and the American press. In New York on May 2, 3DO CEO **Trip Hawkins** presented demos of the hardware's abilities and outlined its final specifications.

One of the visual attractions on offer was a racing demo which onlookers described as 'unbelievable'. With huge cars onscreen in a virtually pixellation-free environment, the images seemed to confirm 3DO's claims of workstation performance. But when challenged over whether the demo was being generated by an M2 unit, Hawkins admitted: 'No, what you saw was a simulation from a machine which was downgraded to emulate what the M2 will be like'. With the press conference taking place just two weeks before E³, doubts were cast over 3DO's ability to deliver a working unit for demonstration at the LA show.

Another concern among developers has been the potential technical difficulties resulting from the marriage of existing and upgrade 3DO hardware. When quizzed over a possible bottleneck between the base unit and the M2, Hawkins could offer only: 'No comment at this time.'

Neither could he provide a list of signed-up M2 licensees, or prices or release dates for the system. And without any software firmed up, M2 will have difficulty competing with its most direct rival, the Ultra 64. Although less powerful than the 3DO upgrade, the 64bit machine will benefit from Nintendo's reputation for quality software as much as any other factor – an important resource on which 3DO simply cannot draw. E

SNK hatches secret plans

SNK has advertised in a Japanese business publication for 'staff who can develop our new 64bit machine and its software'. However, when approached for details of its new system, the company remained stubbornly tight-lipped, insisting that no details are currently available.

The proposed machine, which has been the source of rumours for many months, is still very much in its infancy and isn't likely to appear in time to compete with Nintendo's 64bit project (due April 1996). In fact, it's by no means guaranteed to make it to final production at all, but after SNK's big consumer push with the Neo-Geo (and Neo-Geo CD), it's obvious that the company now has the needs of home users at the top of its agenda.



3DO's pre-rendered car race demo wowed delegates at the official M2 conference. If the finished unit can indeed provide images of this quality, 3DO's performance claim of 'Sega's Model 2 and half again' will be justified

Atari takes the lead in home VR

Atari's Jaguar 2000 add-on is set to bring virtual reality to the masses



Jaguar's original pre-pro VR headset (above), which has now been superseded by a new version (bottom)

It now looks likely that the first company to reach the market with a usable, affordable home VR system will be Atari.

The Jaguar 2000 system is currently in development at Virtuality Group's Leicester headquarters, with the units themselves to be manufactured in Asia. Atari first approached Virtuality (formerly W Industries) in 1993, but no agreement was forthcoming – presumably due to Atari's lack of cash. However, Virtuality continued with R&D using funds raised from its flotation on the stock market, and Atari has since benefited from Sega's out-of-court settlement over patent infringements. Talks between the two companies resumed in November 1994, resulting in the announcement that Virtuality would develop a hi-tech, low-cost home VR system for the Jaguar.

The all-but-complete head-mounted display (HMD) is a comparatively light half a kilo. Optics comprise a single LCD screen providing a field of view of 40° horizontally and 52° vertically. Stereoscopic vision is produced via a pupil projection system, consisting of an array of aspheric acrylic lenses, beam splitters and mirrors.

But of more interest is the V-Trak infra-red tracking technology – branded the fastest tracker ever developed – which boasts a sample rate of 250Hz and suffers a lag time (delay from action to visual response) of just four milliseconds. A trackable joypad is also an option, offering two to six degrees of freedom.

However, there are doubts about whether a single Jaguar has the power to generate a convincing stereoscopic 3D environment. Given the lacklustre efforts so far (*Cybermorph*, *Doom* and *Iron Soldier*) and no extra hardware in the VR unit, it's debatable just how complex a game the Jaguar is capable of rendering. It has been suggested that this is merely Atari's way of setting up a base camp in the VR market, while waiting for Jaguar 2 to provide the engine for a second generation of VR software.

Initial proposals for a $200 unit have been revised up to $250 (£160), but this still represents real massmarket affordability. Atari is due to demonstrate pre-production units behind closed doors at E³.

What is it?

This console was Philips' first entry into the interactive entertainment industry. Licensed from US technology for release in the UK, it had a touch-sensitive keyboard and a range of cartridge software



This prototype Jaguar HMD lacks the unusual infra-red tracking 'bug eyes' of the final unit





The first shot of the complete Virtuality HMD with infra-red tracking device

Atari supplement

The free supplement with this issue of Edge features more details about Atari's plans for VR and multiplayer gaming, with exclusive screenshots of new titles including *Dactyl Joust* and *Defender 2000*.

Edge also speaks to Sam Tramiel about Atari's plans for the forthcoming battle with Sony and Sega, plus the backwardly-compatible sequel to Jaguar, Jaguar 2.

Jaguar 2000 tech specs

Field of view (h x v):	52"x40"
Display format:	428x244 (104,432) pixels
Display:	1"x0.7" active matrix LCD
Pixels:	104,000 (428x244)
Weight:	<500g
HMD tracker:	3 or 5 degrees of freedom
Tracker sample rate:	250Hz
Tracker lag:	4 milliseconds
Tracked joystick:	Yes
Eyeglass potential:	Yes
Price:	$250 (£160)
Availability:	Autumn '95 (US); spring '96 (UK)

US giant takes stake in PC's future

A heavyweight contender has entered the PC graphics battle

it is...

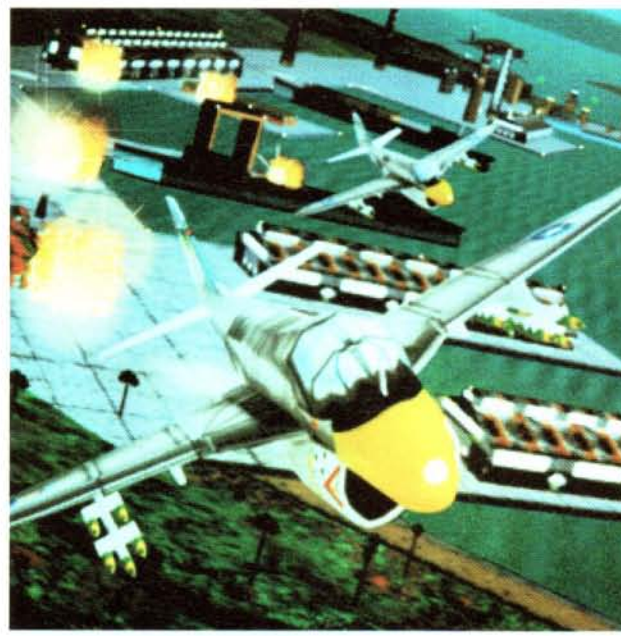
The Videopac G7000, the UK version of the Magnavox Odyssey. Launched in direct competition with Atari's VCS 2600, it failed to grab leading market share and has since become something of a collector's item

The Lockheed Martin Corporation, a company formed in March following the merger of aviation manufacturer Lockheed and military technology specialist Martin Marietta, has announced a PC-based 3D graphics accelerator called Real3D, which it claims can move 750,000 textured, shaded, depth-buffered and MIP-mapped polygons every second – more than any mainstream system currently available.

The Real3D technology is primarily a result of Martin Marietta's longstanding relationship with the defence industry. The firm was involved in NASA research during the 1950s and 1960s, and in the 1970s and 1980s went on to work for the US Defense Department on a variety of graphically intensive projects. The basics of this technology were then applied to other fields – they helped to make Sega's Model 2 arcade board the most powerful currently in the arcades, with Martin Marietta supplying its texture-mapping chips and TARGET database generation system.

LMC has invested over $200 million in computer graphics research and now owns more than 40 patents in the field, including the 'unique anti-aliasing architecture' employed in Real3D. The logic behind the move into home-oriented graphics hardware was explained by **Carlton Caldwell**, manager of marketing communications at LMC: 'As defence spending has been cut, we decided to take our technology into the arcades. Our next step is to move into single-board PC systems. It's a natural downwards progression if you look at our history.'

The first, and most basic, Real3D model will be the R3D/100, which is intended to form part of a scalable hardware family – LMC has already announced the R3D/1000, which will be targeted at high-end users. To ensure the system's continued growth, Real3D employs the versatile API *OpenGL* as its basic command library. Developed by Silicon Graphics and used by Microsoft, this is the nearest thing there is to a standard in the PC development community.



Realtime images of this quality have long been available in military simulators. Now LMC is attempting to introduce it to the home PC

At the heart of the R3D/100 are its geometry processor and graphics processor. The geometry processor is a 32bit chip that deals with tasks like vertex transformations and position, depth, colour and texture clipping assigned by the host CPU. The graphics processor, also a 32bit chip, features the standard 8bit RGB channels plus an alpha effects channel. Primitives are accepted from either the geometry processor or through the PCI bus from the CPU. All coordinates and textures are 24bit (the PlayStation only uses 16bit), and Gouraud shading, anti-aliasing, depth buffering, fog and directional light sourcing are built into the hardware.

The texture processor is another of Real3D's strengths, with a huge variety of options and upgrades available. Up →





The Real3D chipset contains Lockheed Martin's patent-pending anti-aliasing algorithms, claimed to substantially improve performance

LOCKHEED MARTIN

In March this year, Lockheed and Martin Marietta announced a 'merger of equals' on a 'complete pooling of interests' basis.

The new company, Lockheed Marietta Corporation, has four key areas of interest: space and strategic missiles; electronics; aeronautics; and information technology services. It also has energy and materials subsidiaries.

Together, the two companies can boast annual sales of approximately $23 billion and employ over 170,000 people, making LMC a major player in the global electronics industry.

→ to 8Mb of textures can be stored onboard (although 0.5Mb is the base figure), and these bitmaps can be MIP-mapped, reshaped and have alpha effects applied in realtime. Perspective texture mapping – a powerful and realistic technique that has so far only been implemented in software such as *BRender* – is also available.

Although Real3D won't be shipped until the last quarter of '95, LMC is confident that its board will be quickly exploited by the hardware and software industries. 'We're speaking with a number of software developers now,' says Caldwell, 'and we expect the first games to be available by the first quarter of 1996.' This is an ambitious schedule given that most products take over a year to make an impact.

LMC is aiming to persuade PC manufacturers to bundle Real3D with new machines. This is also the approach taken by 3Dlabs, developer of the GLINT chip, although the UK firm is working with Creative Labs to produce a PC games board rather than a pure graphics accelerator. LMC is targeting Real3D at the professional market first, but the proposed $180 price tag is equally attractive to home users.

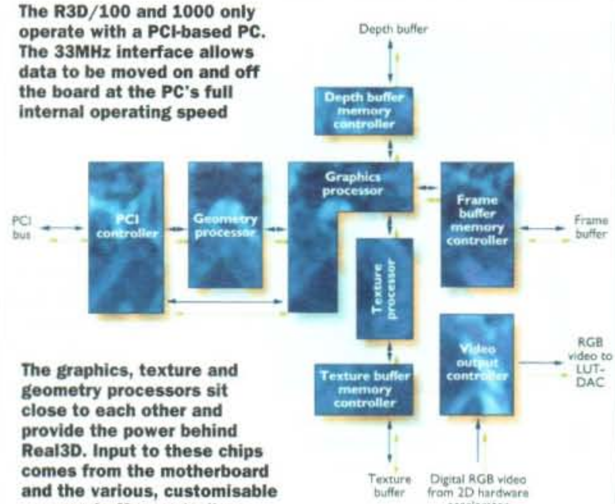
LMC's expertise in 3D graphics is unquestioned. However, its success in the cut-throat PC graphics market is by no means assured. E



LMC claims that images such as this can be generated in realtime for less than $200. Note the true-colour and true-shaded environment

Real3D/100 chipset

The R3D/100 and 1000 only operate with a PCI-based PC. The 33MHz interface allows data to be moved on and off the board at the PC's full internal operating speed



The graphics, texture and geometry processors sit close to each other and provide the power behind Real3D. Input to these chips comes from the motherboard and the various, customisable memory buffer controllers

Real3D tech specs

Graphics processor: True-polygon processor featuring a 32bit RGBA Gouraud-shaded colour path, 24bit coordination throughput, alpha and stencil testing up to 8bits, exponential fog, illumination and directed light source, scissor testing, stipple masking and line patterning

Geometry processor: Enhanced 32bit floating-point processor. Vertex transformations and clipping (position, depth, colour and texture)

Texture processor True-perspective corrected texture. 0.5-8.0Mb memory with up to 192 128x128 MIP-mapped texture maps. 66MHz memory access. 32x32 to 512x512 square or rectangular map sizes. 32bit RGBA texture filter path, texture magnification and minification filtering, clamping and repeating. Six different map formats

Depth buffer memory controller: 0-5Mb memory, 40bit datapath, 132MHz memory access @ 520Mb per second

Frame buffer memory controller: 0.5-10Mb MDRAM, 132MHz memory access @ 400Mb/second, 24bit (true) colour, 320x200 to 1280x1024 video resolution, single or double buffered, block read and write modes

Device driver kits: *OpenGL* and 3D-DDI compliant development kits available

Physical characteristics: 208-pin QFP and 304-pin QFP, 3.3V, 4 Watt aggregate @ 3.3V and 33MHz

Commodore back in business

PC clone maker Escom rescues the Amiga from the scrapheap

The long and tedious winding up of Commodore International came to a dramatic conclusion on April 21. The proud new owner is Escom, the European-based PC manufacturer, which paid $10 million for the company's core assets.

The deal resulted from a chaotic 48-hour period of bidding and court hearings in New York. Escom's original bid for the company initiated a final auction at the New York offices of Fulbright And Jaworski, a firm of lawyers acting for the liquidators. A total of 60 people representing various interested parties were present, but most of them were to be ultimately disappointed.



Bernard Van Tienen, the man responsible for the Amiga side of Escom's business

A surprise latecomer to the saga, Dell Computers, attempted to enter a bid subject to a 30-day investigation period which would allow it to assess the value of Commodore's patents, but this was ruled invalid by the court. A further bid from Computer Connection of California could not be accepted because it was not backed by the required $1 million deposit.

The two favourites in the race, Creative Equipment International and the management buyout team from Commodore UK, surprisingly failed to enter a bid. Alex Amor, president of CEI, had earlier gone on record that he would be prepared to pay up to $24 million for the rights to Commodore's technology, but on the day he simply attempted to join forces with Dell.

Commodore UK withdrew from the bidding process and issued a statement saying that it did not have the 'financial muscle' to compete with Dell or Escom and had 'taken the decision to withdraw early and work with the winning bidder'.

Escom's initial bid was accepted, but the lawyer working on behalf of the creditors had arranged a court hearing for the following day. Dell tried again to stall proceedings by suggesting that it would pay up to $15 million for the company, but support from the creditors, who were owed over $100 million, was lost when Escom upped its offer to a firm $10 million. This was accepted by the court, and Escom found itself the new owner of Commodore International.

Escom, whose UK operation is based in Irvine, Ayrshire, made the news recently as the surprise purchaser of the Rumbelows chain of electrical retailers. Escom purchased over 200 Rumbelows sites from Thorn EMI which could now provide the perfect platform for its expansion into the UK PC market, and for the relaunch of the Amiga.

The A1200 is high on Escom's list of things to do. 'We already have a deal with a Chinese manufacturer, but you will have to give us three months before we have finished units in the shops,' said **Bernard Van Tienen**, who will be looking after Escom's new Commodore division.

'At the professional level we are already discussing a PowerPC-based Amiga. There are many other Amiga technologies that we would like to develop, like a set-top unit. We plan to restart production of the C64 for the Eastern European market. We also hope to be producing a product for the Chinese market. We have a great many plans, but now we can sit down and discuss them and think which ones are important and which are practical.'

The fate of David Pleasance and his management team at Commodore UK has yet to be settled. At the moment they are negotiating with Escom to sell the company – initially valued by Escom at half a million dollars – as a going concern.

Commodore history

1958 Commodore International Ltd begins life in Canada as a typewriter, punchcard and cashtill company.

1974 In an attempt to enter the burgeoning computer industry, CIL buys out a small company called Micro Office Systems, whose staff include many ex-members of Motorola. MOS's designers produce a computer-on-a-chip – effectively a reworked 6800 – which they call the 6502.

1975 The newly formed CBM division of CIL claims to have produced the first personal computer – the Versatile Interface Adaptor, or VIA.

1976 The VIA's keyboard interface leads CBM's designers to produce the KIM-1 or Keyboard Input Module, which boasts a built-in power supply, keyboard, screen and programming language (BASIC 1.0) on ROM.

1977 The technical success of the KIM-1 prompts CBM to unveil the Personal Electronic Transactor (PET) at the Summer CES in Chicago. The all-in-one PET 4000 has no disk drive and relies on specially made cassette tape for data access. It also boasts a mammoth 4K of RAM. Later upgrades for the PET series incorporate disk drives and evolve into the CBM range of business machines.

1980 The $300 VIC-20 is introduced, incorporating the VIC Video Interface Chip. Effectively the first games-based home computer, the VIC-20 has a colour display, built-in music chips and an Atari-standard nine-pin joystick port.

1982 Commodore launches what is destined to be the most popular single computer of all time: the C64. The machine's versatility and power endear it to millions of home and small office users, providing Commodore with the muscle to enter the 16bit market.

1985 The first Amiga – the 256K A1000 – goes onsale. It is touted as a high-end business/creativity machine and bears a hefty £1500 price tag.

1987 The A500 is introduced and rapidly comes to dominate the 16bit home computer market.

1991 Commodore International reports a massive turnover of $1047 million, but diminishing sales and market forces – competition from PCs, Macs and consoles – see profits drop to just $58 million. The ill-fated CDTV is also launched this year.

1992 With barely a murmur, the 32bit A1200 appears. According to Commodore, over three million Amigas have been sold worldwide, yet profits for the year are just $28 million. The ill-fated A600 is also launched this year.

1993 In an impressive display of business acumen, Commodore International Ltd conspires to lose £357 million. The ill-fated CD^{32} is also launched this year.

1994 CIL files for voluntary bankruptcy with the Bahamian courts. Rumours of buy-outs and tales of 'it'll be all be over in a month' continue unabated for a full year before Escom steps in to save the day. In the interim, no new Amigas have been manufactured.

viewpoint



Express yourself in **Edge**. Write to: **Edge** letters, 30 Monmouth Street, Bath, Avon BA1 2BW

After reading Mark Thacker's letter in **Edge** 20 on the declining use of home computers, I feel I should make a point.

If self-taught talent is no longer going to be discovered and developed at home, then this is surely time for schools to step in and provide people with the opportunity. Schools have music departments, teaching people the basics in sound, so it seems an obvious and progressive step, particularly considering the size of the games industry, to teach the basics of programming. Granted, this would probably not solve the problem completely, but it would surely be a step in the right direction. In times of recession, surely an expanding industry presents career opportunities which should be focused on.

As someone else who would very much like to work in either animation or the games industry when I have finished my education, I have seen very little in the way of information or help regarding this type of work. Surely the view that working in videogames is just a kid's dream and cannot offer a 'real' career must have been quashed by now.

As I am only 15, there are probably many things that I don't understand or realise, so any advice or help given in school would be invaluable for making plans at this pretty vital time in my life. I should expect that there are quite a few other young hopefuls who share my concern, and we cannot be expected to learn everything from the letters pages of magazines. I would be grateful for your opinion.

Matthew Ward,
N Humberside



Computers such as the Archimedes (above) are widely used in schools, but is the education system failing people like Matthew Ward?

If the function of schools is to prepare people for 'life', then a vital part of their responsibilities is to ensure that their pupils are computer literate. To this end, the vast majority of schools in the UK now have computer labs, and many of them also offer computer courses. However, as with any other discipline, it's not the job of schools to provide anything more than a general grounding in the subject. Once you've acquired the rudiments at school, you can then go on to gain more specialist knowledge – such as animation or high-level programming – via 'A' level and higher-education courses.

One thing schools should do is provide proper careers information to enable pupils to make informed choices about their futures. If you decide that you want a career in the games industry, you should at least be able to determine the options open to you when you leave school. The games industry itself also has an important role to play in making such information available.

Don't quote me by name, but I and others were horrified to discover that, because the PlayStation has set some very noddy algorithms in silicon and denied programmers' access to the low-level facilities, there is a whole host of 3D problems. We got no answers on this at the developers' conference, where it seemed that Sony experts have very little 3D experience.

The cause of polygon folding [see letters, **Edge** 20] is not as you say. It is caused by the absence of proper clipping, ie a polygon that should be partly offscreen is not clipped but is instead squashed to fit. The result is worsened by the fact tat the PlayStation can only handle triangles – the quadrilateral that makes up the side of the building in your picture is actually two triangles, so what would have been a mild squash affects just one half of the polygon, creating the more visually severe fold along the diagonal.

The *Ridge Racer* programmers have desperately tried to avoid this, the result being that 'scary' polygons sometimes go completely missing (for example, if you crash into a barrier). When more demanding 3D games come along, you'll see further faults, like the texture 'tearing' along diagonals of faces.



James Doole predicts that within a year you'll be able to buy a high-spec Pentium PC with a CD-ROM drive for less than £1000



Philip Ong confesses to a degree of disappointment at the Saturn conversion of *Daytona USA*. Could Sega have done better?

And, although I'm sure that there will still be many graphics to gasp at, 'big' 3D games like space games will be in real trouble. Even the BBC version of *Elite* used 24bit co-ordinates for objects, but did you know that the PlayStation is limited to 16?

Keep it up – and don't fall for the bullshit.

Name and address supplied

Every piece of hardware is a compromise between a designer's cost/functionality balance and the programmer's lust for power. Sony may have omitted some graphics functions but the machine is still more powerful than a high-spec PC. Preventing access to low-level functions is annoying, but good graphics libraries should minimise such drawbacks – until recently, smooth scrolling on the PC was nigh impossible…





Space Griffon is yet another example of the PlayStation's tendency to 'fold' polygons

I am writing to you about the Saturn version of *Daytona USA*. I recently saw it running in a shop near where I live and was surprised. During the third demo (the circuit with the bridge) the picture on the screen flickered and shook badly. I haven't seen *Ridge Racer* on the PlayStation but I assume it runs smoothly. I'm really shocked that Sega has dared it to release *Daytona* in such a bad condition. If *Ridge Racer* can be converted onto a machine so new and foreign to Namco as the PlayStation, why can't Sega do the same thing? After all, it made the machine and knows its capabilities.

I own a Saturn and was ready to get a copy of *Daytona* as soon as possible, but now I'm not so sure. I know the Saturn is not nearly as powerful as the PlayStation but Sega really could have done a better job on the game. I'll admit that it runs fast but it doesn't draw the screen very far into the distance. Also, the other cars are shortened and move jerkily. Some people might disagree with me but I'll stand by what I said, even after the game is officially released.

Philip Ong,
Penang, W Malaysia

***Daytona* was** not as polished as it could have been, but don't write the Saturn off yet. Because of its design, it's a more complicated machine to program than the PlayStation, and it will certainly take longer to master. AM2 was under intense pressure to release the game on April 1 and this affected the quality of the final product. Given that the Saturn was not designed for fast 3D, the conversion was impressive, if not up to *Ridge Racer*'s standard. Sega's new 3D routines, illustrated recently by an early version of *Virtua Fighter 2* (**Edge** 21), proves that it is making significant progress in harnessing the machine's 3D power.

With the next-generation consoles lurking menacingly on the horizon, the question has to be asked whether it is too little, too late on the part of the electronics giants. With the flop of 3DO, Jaguar and 32X, Sony and Sega need to produce an amazing crop of software to tempt the games-buying public in Europe, given that the potential of the new consoles has been neutralised by recent developments in the PC world.

Don't think of me as biased, either. In my (albeit short) lifetime, I have owned, at one time or another, most of the platforms that have been released, including the Odyssey (anyone out there remember it? We still have it in working order!). But the current state of the PC world blows everything open. Not only are processors dropping in price, storage is as well, and so are CD drives, with the NEC 4xi dropping by £500 in the last nine months. Yet the news that could knock these consoles for six is the recent announcement of the first commercially viable writeable CD system, at £300, with CDs at £15 each. As David Bettamy pointed out in Q&A 20, these next-generation consoles cannot record like a video, meaning that we are at least three steps away from one of them becoming a multipurpose multimedia home entertainment system.

If prices continue to drop at the current rate, then within a year you should be able to pick up a P5-60 with a 64bit video card, 32bit sound card, 32 meg of RAM and a 4x writeable CD-ROM drive for under £1000.

Without consoles, computers wouldn't have got into the home, and the consoles' simple schematics will be the design of computers by the year 2000. But now that the PC has overcome its image of bearded techies and suits, they are becoming as integral a part of the home as the piano was 100 years ago. And until someone else builds up a userbase of 40 million, they will be here for a very long time – just like the TV.

James Doole,
Broadstairs

The speed at which the cost of PC technology continues to fall continues to surprise, but a machine with the specifications you list for under £1000 is optimistic. RAM prices have not decreased by a great deal over the past few years and it is

Continued next page

viewpoint



Does new technology like the GLINT chip (above) give PCs the edge over consoles? (See letter from James Doole)

Continued

questionable whether CD-ROMs can ever become a viable alternative to a fast hard drive for database-style applications.

Although the PC may be in the ascendancy at the moment in terms of sales, to write off consoles completely is naive, to say the least. Future machines like M2 and Ultra 64 will offer polygon performance far in excess of anything a fast Pentium can provide. Although the PC's userbase will remain far ahead of the consoles' combined total, competing with the cheaper, faster gameboxes requires acceleration boards. If custom polygon cards such as the GLINT ever become a 'standard', then the PC could indeed stay up to speed.

A traditionally conservative and secretive company like Nintendo is unlikely to endear itself to a fanatically inquisitive magazine like **Edge**. However, when **Edge** criticises Nintendo for sticking with cartridges, I feel that it misses the point.

Firstly, it is sheer naivety to say that a CD mechanism costs a 'mere $30', as cited by your 'long-established champion of the CD cause' (?) (**Edge** 20, page 9). The cheapest CD personal audio CD players and double-speed CD mechanisms for PCs both cost £100.

Secondly, the hidden cost of using CDs is that they need far more RAM than cartridge-based systems for the information to be loaded into them. The bottom line is that with a CD mechanism and the extra RAM, the machine costs far in excess of what we have come to expect from a videogames machine.

Thirdly, since *Ridge Racer* loads 28Mbits of RAM at one go (admittedly, music is streamed off CD), what's wrong with Nintendo's provisional 100Mbit limit for its Ultra 64 carts?

Fourthly, magazines and readers alike seem to view the 'CD revolution' with unrealistic hopes (*Virtua Fighter* on Saturn CD costs the equivalent of £50!) even though, as your NEC article (**Edge** 20, page 12) shows, solid state is clearly the future.

Fifthly, although NEC, Atari, Bandai and SNK now all use CDs, either their market share is too small or their machines do not have a future outside Japan.

It is quite possible that, with the yen unshakeably strong against the pound and especially the dollar, Sony and Sega may find out what The 3DO Company has already discovered.

Although Nintendo has its faults, it should be commended for not letting idealism cloud its commercial judgement. The bottom line is that Nintendo, quite rightly, does not wish to launch an expensive CD-based system in the vain hope of a perceived saving in the price of software.

Mohammed Iqbal Shaikh, Leicester

Nintendo has chosen to stick with cartridges for a number of reasons. First, the company is claiming that its choice of 'silicon over optical' was forced by the Ultra 64's architecture. Because of the RAM demands of its graphics technology, it's likely that it was a far cheaper (and faster) solution to use 1.5Mb of onboard RAM to act as a decompression buffer for its compressed cartridge data rather than the alternative – a CD drive and even more RAM. As you suggest, having chosen the cheaper option, Nintendo is now in a position where it could have a clear price advantage over its CD-based rivals.

Incidentally, CD-ROM drive mechanisms do cost as little as $30 (if bought in bulk), with front-loading models (including motors) costing slightly more than top-loaders. Personal CD players, with their extra design and functionality considerations, naturally cost more, although given that high-street stores generally mark goods up by around 30%, they are still cheap.

But the prime consideration for Nintendo must have been the fact that cartridges have made the company all its money in the past. And with $3 billion sitting in the bank, it has every reason to be wary of jumping onto the CD-ROM bandwagon

Of course, the basic argument at the centre of the cartridge vs CD-ROM debate still exists. Large ROM cartridges will always cost more than CDs, and unless Nintendo intends to run itself as a charity, this extra cost will have to be passed onto the consumer. Solid state may well be the longterm future, but until the technology exists to manufacture memory in huge quantities for next to nothing, it will remain relatively expensive.

However, the fact that Nintendo is currently working on an optical mini-drive for the Ultra 64, to be released in 1997, reveals that the company recognises the limits of cartridge technology.



Why is Nintendo ignoring the advantages of CD? (See letter from Mohammed Iqbal Shaikh)

Could someone please tell me exactly what the specious and much-bandied term 'arcade perfect' actually means? It never ceases to amaze me how people are seduced by the frantic hype preceding a hardware launch and then proceed to bemoan the fact that the new machine fails to live up to the impossible expectations they have. I recently bought a PlayStation after reading previews in your magazine and recognised it for what it was: a real advance in gamesplaying architecture. I too was somewhat dazzled by the hype but am pleased to report that it allows me to play games I would have thought were impossible a few months ago. Surely this is what it is all about? Not a self-defeating focus on what new architecture can't do (ie match the performance of dedicated PCBs costing tens of thousands) but pushing the frontiers of performance in the home to new heights. Of course, people are disappointed with the occasional slowdown, but honestly, isn't the thrill of playing *Ridge Racer*, *Tekken* or *Virtua Fighter* at home worth it? And anyway, at least give the developers the time to get used to the hardware before being over-critical (*Ghouls And Ghosts*, anyone?). The stagnation (or should that be complacency) that has plagued the industry for the last few years is at last being challenged by the leap in benchmark performance we are currently witnessing. Developers must produce titles that are significantly superior to the 16bit efforts to evolve. These days, I wait impatiently for the next incredible screenshot or review and marvel at the wonder of it all. Now, isn't that what the future should be all about?

S Rogi, Bromley

The increasing crossover between coin-op and console technologies means that a game in the home *can* now be 'arcade perfect' and basically indistinguishable from its coin-op parent (Namco's PlayStation version of *Tekken* is arguably *better* than the coin-op!).

However, the onward march of coin-op technology means that 'arcade perfect' conversions will be the exception rather than the rule. As long as coin-ops have the technical edge over home systems, nitpicking will remain an integral part of the gaming experience for some...



Capcom's *Ghouls 'n' Ghosts* coin-op has never been 'arcade perfect' in the home (see letter from S Rogi)

Prescreen

Following the slightly disappointing *Daytona USA*, **Edge** looks at the three titles that Sega is hoping will bolster its Saturn stable: the futuristic 3D racer *Gran Chaser*; an update of the classic coin-op *Shinobi*; and the action-based flight sim *Wing Arms*.

On the PC, *Terminal Velocity* and *Duke Nukem 3D* show off Apogee's ever-improving 3D engines; while PlayStation aficionados can get an early look at *Ace Combat*.

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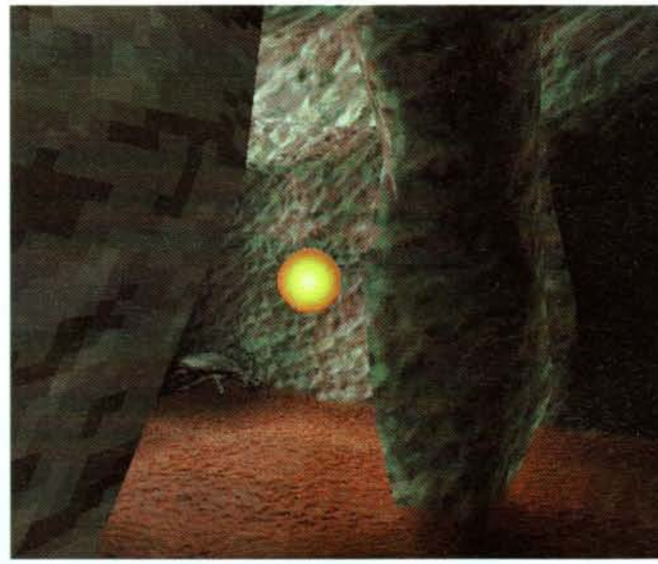
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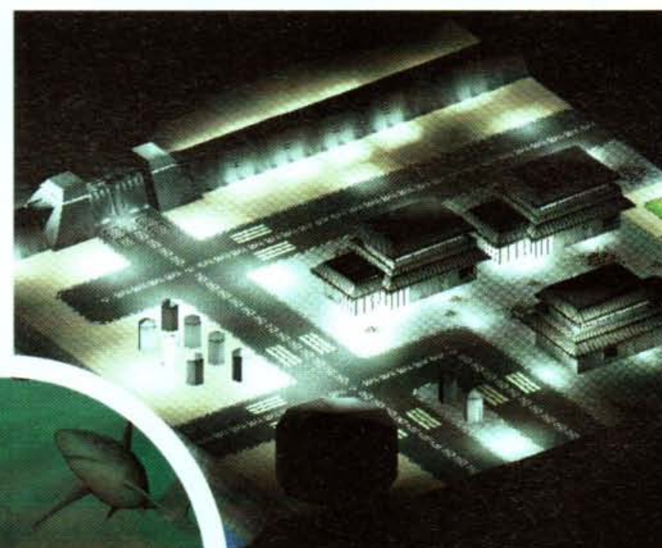
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Coming soon from Bullfrog (clockwise from top left): its surprise June-release racing game (yet to be named); *Dungeon Keeper* (Peter Molyneux's personal favourite); the company's first PlayStation game, *Syndicate Wars*; the tense and atmospheric action-strategy title *Creation*; *Magic Carpet 2*, a greatly enhanced (and faster) sequel to one of last year's most successful PC titles; and *MIST* (working title), Bullfrog's tribute to Superman

Bullfrog

In the seven years it has been in existence, Bullfrog Productions has gained an unparalleled reputation for quality and innovation. As the Guildford-based company prepares to release a slew of new titles, **Edge** talks to the lords of the game about their plans for 1995



Bullfrog is on a bit of a high at the moment. Within the last six months it has released the most graphically advanced game ever on the PC, *Magic Carpet*; has been bought by EA for over $50 million; and has just cleaned up at the ECTS awards. With the company's next wave of products about to break on the PC and PlayStation, **Edge** met the people who built the Bullfrog fortress and scrutinised the eight projects it has in development.

Bullfrog has always prided itself on developing original games – *Populous*, *Magic Carpet* and *Theme Park* have all been praised for their eminently playable blend of action and strategy. And the company's next few releases look set to enhance that reputation.

One of those new games is *Dungeon Keeper*. 'In my mind the roleplaying game hadn't changed much in the last seven or eight years,' asserts **Peter Molyneux**, Bullfrog head honcho and lead programmer on *Dungeon Keeper*. 'Traditionally, you always get to play the heroes – the all-round wonderful guy who saves the world. I thought it would be much more fun to play the evil ones – it's always more fun to be evil!'

In *Dungeon Keeper*, the player has to supervise a dank collection of tunnels packed with 32 species of quarrelsome fiends. The aim is to establish the mightiest, most treasure-laden labyrinth in the world, thus enhancing your magical and physical presence. Increasing your power results in a larger dungeon and a greater reputation, and as word of your achievements spreads, more powerful bands of adventurers try and plunder your trove.

Bullfrog's games all require an alarming level of artificial intelligence, and *Dungeon Keeper* is no exception. Bullfrog has been focusing much effort on its AI team for some years (there's now a dedicated AI group working at its Guildford offices), which has resulted in a new technique called 'Personality Mapping'.

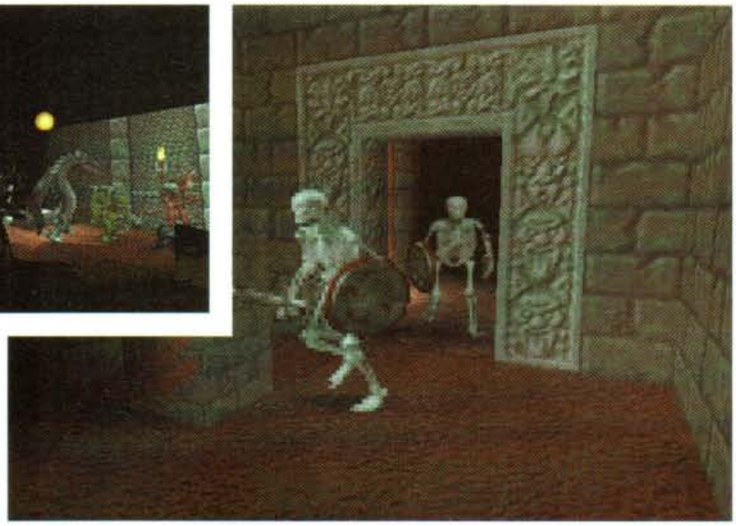
'The AI has been evolving since *Populous*,' explains Molyneux. 'Each character in *Populous* occupied 48 bytes. That rose to 512 bytes in *Theme Park*, and now we're up to 1024 in *Dungeon Keeper*. Each character has a sense of smell, different hearing abilities, individual vision... Some are even more curious than others and so come to investigate trouble faster.'

Dungeon Keeper also benefits from Bullfrog's powerful lighting algorithms, used so effectively in

Continued next page

Bullfrog







Theme Hospital **is the second game in Bullfrog's designer series. The ability to inflict harm on innocent patients should make it a winner**





A selection of the 32 monsters currently resident in ***Dungeon Keeper*** **(top). The views can all be fully customised (middle). Pre-rendered card playing (above)**

Dungeon Keeper**'s multiplayer mode is 'the best ever', according to Molyneux. You can either control the dungeon or enter as a party of adventurers to do battle**

Magic Carpet's water reflections. All surfaces can be factored in and calculated in realtime, so fireballs hurled down black corridors light the walls along their way before plunging the player back into darkness. The maths is now so advanced that mirrors cast reflections of exploding spells with minimal slowdown.

Another forthcoming release is *Creation*. Since this subterranean odyssey was unveiled in **Edge** 4, its smooth-moving underwater scenery and surreal action have aroused much anticipation. *Creation* is Bullfrog's thriller, substituting the pace of *Magic Carpet* for a slower, more tense style of gameplay.

Bullfrog has gone to great lengths to ensure that *Creation* is suitably atmospheric. Things become progressively ominous as your submarine plunges into the ocean depths, shooting off flares every five seconds to penetrate the gloom. Near the surface, digitised coral reefs contribute to the realism. And Bullfrog claims that it has developed fast-perspective scaling interpolation to negate the ugly effects of zooming bitmaps.

And then, of course, there's *Magic Carpet 2*, the inevitable sequel to one of the best-received games of last year. 'We did a lot of studying about what people liked about *Magic Carpet* and basically we found that people enjoyed destroying things,' says Molyneux. To accommodate this primitive urge, Bullfrog has added a further 20 spells (including gravity wells and tidal waves) and introduced levels of casting skill for each. Night-time missions are also included, which is where the new glass castle option really comes into its own.



MC2 (like the majority of Bullfrog's new games) depends on a greatly enhanced version of the *Magic Carpet* engine. 'The original graphics engine is two years old now,' accepts Molyneux, 'but with the developments we've made since then, it's now 75% faster.' And the gameplay has also been tweaked – it's more of an action-roleplaying game than an action-strategy one.

Theme Park has a successor, too, in the form of *Theme Hospital*. Peter Molyneux's first program was a business simulation, and it's evident that the desire to make money hasn't entirely been overshadowed by the desire to kill things. The game sees the player guide a hospital from the Middle Ages ('where their ethos was if it hurts, bleed it or cut it off') through the present to the future, offering the chance to make serious money off the backs of helpless ill folk.

Bullfrog's remaining two games both use a revolutionary in-house technique called 'Skeletal Mapping'. 'In most 3D games, the artist had to think of every move a character could perform and then draw the appropriate animations,' explains Molyneux. 'With our simulation we calculate a skeleton and the program calculates any action you perform by itself.'

MIST (*My Incredible Superhero Team*) is the working title for Bullfrog's November release. Each player takes control of a superhero whose mission is to protect his own city from invaders. Its real innovation lies in the ability to customise the characters – Bullfrog is hoping that the only limitation to the player's fun will be his own imagination.

'Through the use of Skeletal Mapping, each player gets to create his own superhero', says Molyneux. 'If you want to make him strong and give him rubber wings and death vision, then you can do that. But of course, they've all got their Achilles' heel.'

The combination of a fully modelled city, textured polygon characters and a dedicated Pentium mode running at 30fps should be a powerful combination.

Biosphere is Bullfrog's 1995 homage to the title that made its name, *Populous*, combining the *Magic Carpet* engine (used for the scenery) with *Populous*' wargame playing style. Skeletal Mapping is integral to the gameplay – players have to experiment with genetic engineering to develop new, ever more vicious lifeforms, which are

Continued







Creation **boasts a fractal seabed (top). The submarine's lights fade as it recedes into the depths (middle). Cut-scenes create atmosphere (above)**



***MIST*, Bullfrog's tribute to Marvel-type superheroes, is perhaps the company's most unusual project. It uses Bullfrog's revolutionary Skeletal Mapping technique to transform the characters as their powers increase**





***MIST* takes place in a skyscraper-filled city which can be completely destroyed by the player. The game will incorporate a significant strategy element, but the multiplayer game will be action all the way**

then used to destroy their rivals on the planet.

As **Edge** was preparing this article, it uncovered details about a hitherto unknown Bullfrog project, due for release this June. The game – which doesn't even have a name yet – uses a version of the *MIST* engine as the basis for a high-speed racing shoot 'em up.

'Normally our games are very original so we're not worried about people copying them,' says Peter Molyneux of the project, 'but this is a little derivative so we've kept it secret for longer'.

Bullfrog is one of the few successful companies today which has ignored the 16bit consoles – Molyneux's dislike of them is well known. But now the firm is striking out into new territory with its first in-house console game, the PlayStation title *Syndicate Wars*.

Set in a city composed of SGI-modelled buildings which can be manipulated in realtime, *Syndicate Wars* is already looking stunning – even though its graphics are only 15% complete. Perhaps the most impressive feature of the game is its lighting effects – Bullfrog's lighting algorithms are being used in most of its PC titles, but the extra power provided by the PlayStation allows even more spectacular visuals to be employed. Car headlights sweeping into the darkness and people running across reflective buildings are 'second to none', according to Molyneux.

Bullfrog is taking advantage of the PlayStation's abilities to enhance *Syndicate Wars'* gameplay, too. The final product will contain a high proportion of realtime events – buildings exploding, weapons firing and people burning to a crisp will all be commonplace.

With eight original and technically adept titles in the works, and its development staff scheduled to increase 50% by September, Bullfrog's future as Britain's premier developer seems assured. E





***Biosphere* is arguably Bullfrog's most conventional game. The scenery is inspired by *Magic Carpet* (top). The characters are still rough (bottom)**





The PC version of *Syndicate Wars* (top and above) can run in SVGA, although you'll need a Pentium



The PlayStation's power is evident in *Syndicate Wars'* lighting effects. Bullfrog intends the finished game to use the machine's twoplayer link-up capability

Head to head







The PlayStation's link-up cable (top) allows a pair of machines to be linked together for simultaneous twoplayer action. The cable – the first of a range of connecting devices planned by Sony – plugs into the serial port on the back of each machine. In order to fully appreciate the system, Edge was treated to an early playable version of Psygnosis' superb *Demolish 'em Derby* (above, left), coded by Newcastle Amiga veterans Reflections. The twoplayer mode caters for some splendid car-bending mayhem





The prospect of multiplayer PlayStation games could give Sony's console a huge credibility boost. **Edge** gets connected

Capturing the visual finesse of modern coin-ops on a home console is a seductive goal for games programmers. And, given the increasingly close relationship between arcade and console technology, it's not an impossible task. However, as developers strive to capture the look and feel of popular arcade games (and in some cases, such as Namco's *Tekken*, achieve a perfect match), one aspect of coin-ops' popularity has remained overlooked: multiplayer link-up.

Home computers have long enjoyed the benefits of link-up potential. As well as 16bit classics like Bullfrog's *Populous* and Geoff Crammond's *Stunt Car Racer* (which not only accommodated the connection of two Atari STs or two Amigas but even allowed an ST to be linked with an Amiga!), there's a large library of network and modem-linked games for the PC, including id Software's legendary *Doom* and Interplay's *Descent*. Consoles, on the other hand, have had a tougher time catering for multiple players.

Being restricted to a single screen is the most conspicuous hurdle, but multiplayer games can usually be designed around this drawback. Multitap adaptors have long catered for the party potential of classics such as *Bomber Man*, and sports games like *FIFA International Soccer* cope admirably on a single screen. However, driving games, by their very nature, require that each player has his own display, and therein lies a problem.

The splitscreen format is the traditional method of tackling the multiplayer driving game. The best examples of this are the superbly playable SNES game *Super Mario Kart* and its protegés. But although the twin letterbox system (or quadrupal, as is the case with *Street Racer*) can be used to great effect, it usually demands a detrimental reduction in the quality and size of graphics, in order to keep the speed of the game up. Another drawback is that a splitscreen display allows each player to see exactly what the other participant is doing, so that it's far harder to surprise your opponent. (Japanese arcades have sidestepped this problem by linking together beat 'em up cabinets and positioning them back to back.)

Sony is one of the first companies to try to replicate the multiplayer experience on consoles, although Atari already has a twoplayer link for the Jaguar (and a superb version of *Doom*), and Sega is developing a similar system for the Saturn. Sony's PlayStation link-up cable allows two machines to be hooked together, each using a separate television. Despite the fact that the cable isn't due out until July, **Edge** was invited to test an early version of Psygnosis' link-up racing game *Demolish 'em Derby*, which now incorporates twoplayer code and is scheduled for release shortly after the machine's UK launch.

Newcastle-based developer Reflections has been working on *Demolish 'em Derby* for the last

Continued next page

PlayStation **link-up**





The huge video wall in *Demolish 'em Derby* provides a simultaneous display of the action. Note the transparent smoke – one of the many superb details in the game









Demolish 'em Derby **(from top): taking pole position at the start; it doesn't take long for traffic to build up; the ensuing chaos gradually takes its toll; the only vehicles that are safe are part of the scenery (above)**

nine months – the team bolted on the necessary code just days before **Edge** saw the game. At this stage in development, booting up the game on both machines requires swapping a single disc from one PlayStation to the other but, unsurprisingly, the finished game will require one CD for each machine – to minimise error correction and game crashes, according to Sony, although the ability to play the CD soundtrack through both TVs is obviously a consideration too. When the game is loaded on both consoles, each program looks for the other machine and then the code is synchronised so that both players are represented onscreen.

The version **Edge** played was around 55% complete and featured just one track – an oval *Daytona*-style affair packed with 21 cars – although the finished game will include a remarkable 50-60 courses based on five or six graphical themes. A programmable replay system will also be incorporated, as well as a wide variety of views, including an airship perspective.

But the game's most outstanding feature is the realtime deformation of the vehicles – unlike *Ridge Racer*, smashes and pile-ups really do affect the cars' bodywork. The transparent smoke and steam that billows from crumpled bonnets and exhausts also makes a convincing contribution to realism. And, perhaps best of all, crashes can be saved onto the PlayStation's memory cards, enabling you to record those classic moments to savour at your leisure.

Despite the density of on-track traffic and the level of graphical detail, the action in *Demolish 'em Derby* remains suprisingly fast and smooth. Because of the cable's high baud rate (and Reflection's concerted efforts in this area), the link-up has minimal effect on the game's frame rate. In fact, the only data transmitted through the cable is the cars' X and Y coordinates (rather than all the screen information), and the result is that there's virtually no noticeable loss of speed in the entire race. Sony claims that the system has been designed to cope with games running at any frame rate – a title such as *Tekken*, for example, which runs in one frame (60 frames per second) would suffer very little in terms of speed loss.

As well as *Demolish 'em Derby*, Psygnosis has three other PlayStation projects in the pipeline compatible with the twoplayer link-up (see opposite): *Wipeout* (**Edge** 21), *Assault Rigs* and *Krazy Ivan* (formerly known as *Ideal*). At the time of writing, the company was busy preparing link-up versions to be unveiled at the May E³ show in Los Angeles.

Despite the inconvenience of having to set up two television sets (although in Japan the availability of widescreen, double-tuner TVs means that both displays can sit side by side on the same screen), software developers seem keen to take advantage of the PlayStation's link-up capacity. Given the level of commitment from companies such as Psygnosis, as well as the efforts of many thirdparties, a twoplayer head-to-head option could soon become a standard feature of PlayStation games.

PlayStation **link-up** cable

The PlayStation's link-up cable will be released in Japan in July for ¥2000 (about £18). This will coincide with the first game to take advantage of it – *Metal Jacket*. The cable has a peak baud rate of 4Mbits/sec and feeds data directly to the CPU, which processes it and then transmits it to the other machine at the baud rate specified by the programmer.



The only multitap system currently in development at Sony Computer Entertainment is a multi-joypad system similar to the SNES's Super Multitap, which will allow four pads to be connected to each joypad port. When used in conjunction with the link-up cable, it will enable up to 16 players to compete against each other.

16-player *Bomber Man*, anyone?

Continued

Other **PlayStation** link-up games

Psygnosis

In addition to *Demolish 'em Derby*, three other Psygnosis games are scheduled to use the PlayStation's serial link.

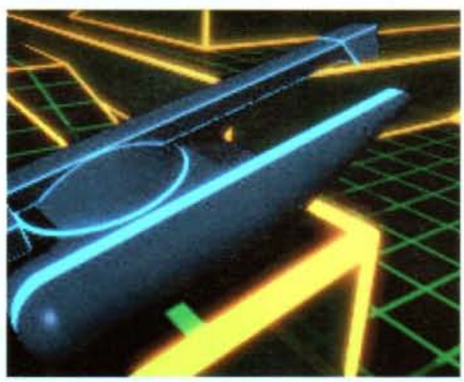
Krazy Ivan (top, top right) is a futuristic combat simulator in which two serial-linked players engage in a head-to-head battle while drone robots shoot at them.

Assault Rigs (bottom left) will feature a *Cybersled*-style one-on-one battle, but another mode will let two players compete to collect a set number of objects before escaping from the arena.

Wipeout (bottom right), the futuristic racing game premiered in Edge 21, will offer a head-to-head mode with six other craft and a one-on-one battle mode (à la *Super Mario Kart*).





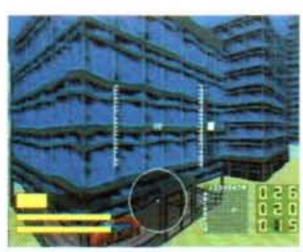


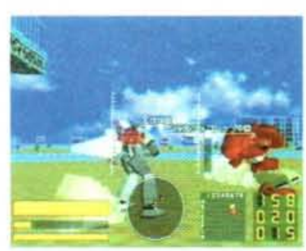


Metal Jacket (Pony Canyon)

Metal Jacket, first shown in **Edge** 18, will be the first link-up game to be released on the PlayStation in Japan. It's possible that Pony Canyon will bundle the game and the cable in one package (like Artdink's *A.IV Evolution* pack, which included a PlayStation mouse and memory card), although this has yet to be confirmed.

Edge recently visited the company's Tokyo offices and got to grips with an early version of the twoplayer link-up. Compared to the best 3D seen on the PlayStation, *Metal Jacket*'s environments are surprisingly crude, with a poor level of graphic detail and a disappointingly low speed. However, they do conceal some upbeat gameplay, and the extensive range of game configurations could give *Metal Jacket* some longevity. The game will be released July 14 in Japan.











It's possible to jump from building to building in *Metal Jacket* (top). The game can be configured to enable each player to fight either as part of the same team of robots or simply head to head. A variety of different climatic environments can be selected

Gran Chaser





In story mode, the races themselves are interspersed with beautifully airbrushed anime characters

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**In-house**
Release date:	**26 May (Jap)**
Origin:	**Japan**

The Saturn will soon be able to boast its own futuristic racing shoot 'em up to rival 3DO *Crash 'n Burn* and the forthcoming PlayStation *Wipeout*

Sega's latest Saturn racing game, *Gran Chaser*, was originally called *Grand Racer*, but the title's similarity to that of the abominable *Gale Racer* forced a hasty rethink on Sega's part. (The UK release will get a completely new name.) Luckily, the two games are very different, with *Gran Chaser* offering 3D environments far superior to *Gale Racer*'s crude scaled sprites.

In gameplay terms *Gran Chaser* is similar to 3DO *Crash 'n Burn* and PlayStation *Wipeout* – although it's actually loosely based on the uninspiring PC game *Cyber Race*. The object is to race around realtime tracks in high-speed sleds, destroying the opposition in the process. This all takes place in a futuristic environment based partly on the creations of *Bladerunner* designer Sid Mead.

The graphics are strong enough to attract those people disappointed by *Daytona*. Fast scrolling, a wide variety of scenery – including moving monsters, lava lakes, water and ice caverns – and convincing, remarkably unpixellated texture mapping all contribute to the game's appeal.



Two ships jostle for first place at 230kph. Speeds can reach 500kph without boost

The amount of onscreen tactical data should be enough to satisfy even the most information-hungry gamer. A *Daytona*-like radar is combined with a simplified track schematic and a proximity detector to ensure that the player is always aware of what's going on around him.

There are six basic models of sled, each of which has its own acceleration, top-speed and handling characteristics.









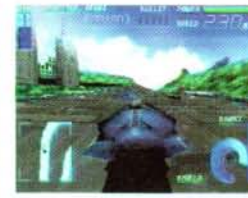


The lava level contains some of the most spectacular effects: motion blur in a tunnel (main); a fully zoomed-out view (middle top); check out the Gouraud shading (top right); a weapon explodes (bottom right); pyrotechnics (bottom left)



The twoplayer game (above) may well be *Gran Chaser*'s strength. Although there is slowdown and the screen inevitably looks cramped, a head-to-head showdown is always a crucial part of a racer's appeal









Dragons arc over the track as the player races beneath them (upper middle). Some of the levels feature imposing skylines (above)

All of them cruise a few centimetres above the surface of the track and are equipped with weapons, speed boosts, a speedometer and damage indicators. The other characteristic they have in common is that they all appear very small onscreen until unless extremely close-up. There is a choice of three views to compensate for this, though, of which the in-car one is the fastest and the high-behind one the slowest.

The structure follows the well-worn 'win-prizes-upgrade' path. Several playing options are also available to provide extra longevity. These include the now obligatory story mode and a simple three-lap thrash which may prove the best bet for owners of imported copies unwilling to sit through hours of Japanese speech. On offer too is a selection of tracks, each of which offers a unique challenge. These are in turn divided into beginner and advanced courses, with the beginner tracks given typically quirky Japanese names like Terra, Glacies, Vastitas, Nubes and Evoflames.

Many people regarded the lack of a twoplayer mode in *Daytona* as one of the game's most obvious weaknesses. Thankfully, *Gran Chaser* remedies this shortcoming with a splitscreen, one-on-one racing option. However, the extra workload on the Saturn's twin SH-2 processors causes the frame rate to drop slightly.

Understandably, *Gran Chaser* has failed to attain the same level of pre-launch hysteria as *Daytona* did. But if Sega can get the structure and playability right in its new racer, the fast action should ensure that it at least matches *Daytona* in terms of gaming satisfaction.



Tunnels provide some of the most intense racing (above). The texture mapping remains remarkably clear





Five green lights is the signal to step on the gas (top). A panning *Ridge Racer*-style replay takes place at the end of a race (above)

Terminal Velocity

Veteran PC developer Apogee is aiming for its 29th shareware success

Format:	**PC**
Publisher:	**Apogee**
Developer:	**Terminal Reality/Apogee**
Release date:	**Out now (shareware)**
Origin:	**US**





The tunnel sections provide some exciting blasting action (top). A blood-red background provides an indication of this level's deadly nature (bottom)

Apogee is one of those firms that has lived for a long time in the shadow of others. In 1987, it came up with the 'Apogee Model', whereby the first instalment of a game is released as shareware and the subsequent sections sold direct – an idea on which id Software later built its unparalleled reputation.

However, Apogee's latest release might just wrest some of the glory back from id. *Terminal Velocity* is best described as a hybrid of *Magic Carpet* and *Descent* – a combination that will delight the vast majority of PC gamers. The game gives the player total freedom to explore, dispensing with tedious manuals and infinite button permutations and concentrating instead on providing an immediately accessible playing experience. A multiplayer network option is also available, allowing up to eight players to take part

The graphics engine, developed by Mark Randel (the name behind the hugely successful Microsoft *Flight Simulator 5* engine) is one of the most advanced ever seen on the PC – even on a 66MHz 486, the animation is smooth and fast. A mixture of shaded polygons and bitmaps is used to portray the gameworlds, which range from ice caverns to lava-spewing primeval landscapes and complement the action perfectly

The shareware version of *Terminal Velocity* is now available on Web sites around the world (try ftp://146.169.2.10/computing/systems/ibmpc/msdos-games/Games/Apogee in the UK).











Cruising over a remote settlement (top). Enemies swoop in (middle left) as you fly over the clouds (middle right). One of the weapons (above middle). Note the fog effect (bottom)

Duke Nukem 3D

Apogee's post-*Doom* PC blaster adds a few significant gameplay tweaks to the maze shoot 'em up genre

Format:	**PC**
Publisher:	**US Gold**
Developer:	**Apogee**
Release date:	**Out now (shareware)**
Origin:	**US**





Some of the doors can be kicked in (top). Spent shells are ejected (above)

Considering Apogee's heritage of 3D maze games, it's not surprising that the company is working on a new series of labyrinthine blasters. There are currently four games in development, the most advanced of which is *Duke Nukem 3D* (unimaginatively named after one of Apogee's first commercial hits, plain old *Duke Nukem*).

Apogee's most recent maze game, *Rise Of The Triads*, was fun to play but very derivative. So it's refreshing to discover that *Duke Nukem 3D* features considerable gameplay enhancements. Chief among these is a fully interactive world: shoot a light and it flickers; shoot a containment window and objects are sucked out. Some of the biggest weapons even demolish entire walls. These additions make a significant difference to the player's sense of immersion in the game.

It's also possible to swim through water-filled tunnels (complete with bubbles floating to the surface) to access sealed-off areas of the map, as well as climb skyscrapers to gain better vantage points. The game is fully light sourced, with mirrors, reflective surfaces and translucent sprites all adding to the atmosphere.

Perhaps the most revolutionary aspect of *Duke Nukem 3D* stems from Apogee's desire to improve the multiplayer game. Scattered around the levels are strategically placed video cameras. These can be accessed by players with the correct code, allowing them to 'spy' on the activities of their opponents and therefore lay booby traps (including laser-activated mines which explode when the beam is broken) with more precision.

Apogee has been around since 1987 and has an enviable list of titles behind it. With *Duke Nukem 3D* (and, later this year, *Ruins*, *Blood* and *Shadow Warrior*), it's almost certain to get a higher profile.

Video cameras can be accessed by players with the correct code, allowing them to 'spy' on their opponents







Apogee's interpolation routines have reduced pixellation to a minimum (top). Another enemy is dispatched with gory glee (above)



The plasma cannon is just one weapon in an extensive range of hardware

Shin Shinobi Den



Eight years after his first arcade outing, Sho gets another chance to show off his Ninja skills, this time in the Saturn update of Sega's classic actioner







This Oriental masked boss (top) spins in impressive 3D. Blood is a new addition to the series (above). Yes, a mine-cart level is included (above right)





***Shin Shinobi Den*'s blend of digitised and hand-drawn graphics has mixed results (above and middle)**

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**In-house**
Release date:	**June (Japan)**
Origin:	**Japan**

Initially scheduled for release last December, *Shin Shinobi Den* is one of the most long-awaited titles in the Saturn's early software schedule. The game follows the further adventures of Sho, a Karatedogi-clad Ninja who first appeared in the hugely playable *Shinobi* coin-op in 1987, subsequently featured in a sequel, *Shadow Dancer*, and also starred in one of Sega's first Mega Drive games, *Super Shinobi*.

Shin Shinobi Den (*New Legend Of Shinobi*) is in the same vein as *Super Shinobi*, with a more pedestrian pace than the coin-ops and a wider range of





Sho faces a boss character in front of a shimmering backdrop (above). Like *Super Shinobi*, this update includes a dinosaur encounter (above right)









A cheesy, chop-socky video intro precedes the game. Here, a young girl is captured by the Galuso organisation. Sho is on hand with a sprinkling of magic and plenty of violence

attacks, including the standard sword swipe, a shuriken throw and the devastating somersault shuriken launch. Sho's range of Ninja magic has also been updated, and the resulting effects are more eye-popping than ever.

The most obvious departure from previous *Shinobi* games is the depiction of Sho himself and the plethora of enemies he faces, each of which has been digitised, *Mortal Kombat* style, from a real source. Another feature it shares with Williams' notorious beat 'em up is a predilection for bloodletting: a swift slash of Sho's blade is enough to cleave an opponent in two, which is inevitably accompanied by a substantial outpouring of gore.

This time around, Sho's mission involves taking on the might of a criminal organisation known as Galuso. Operatives of this underground collective work out of bases throughout the world, providing the excuse for Sho to embark on a globetrotting jaunt around various exotic locations, ranging from Egypt to the Far East.

The levels offer considerable variety, and, although at heart *Shin Shinobi Den* fits the established platform/slash 'em up mould, the level of detail is exemplary. Slash through the boughs of a tree as you pass, for example, and they crash to the ground, using the Saturn's hardware rotation.

In each of the nine settings, two boss characters appear – in keeping with tradition, one at the midway point and one at the end. As any *Shinobi* veteran will be aware, one of the main attractions of the series has always been its wildly imaginative range of bosses. However, this is where the Saturn game could fall down: considering the machine's much-lauded 2D strengths, a number of the bosses are depressingly inadequate for a 32bit system, and some would even look at home on the Mega Drive. There's certainly a stark contrast between this and PlayStation games like *Gunner's Heaven*, which manipulate enormous, complex characters in true arcade style. However, as the game is still in development, changes to aspects such as this are likely.

Shin Shinobi Den will doubtless perform well due to its name alone, and it appears to have almost every element in place to enable it to do justice to its heritage. With the right tweaks here and there, it could well become one of the Saturn's strongest straight action titles.





Frying in a forest (middle). Some bosses are worryingly inanimate (above)





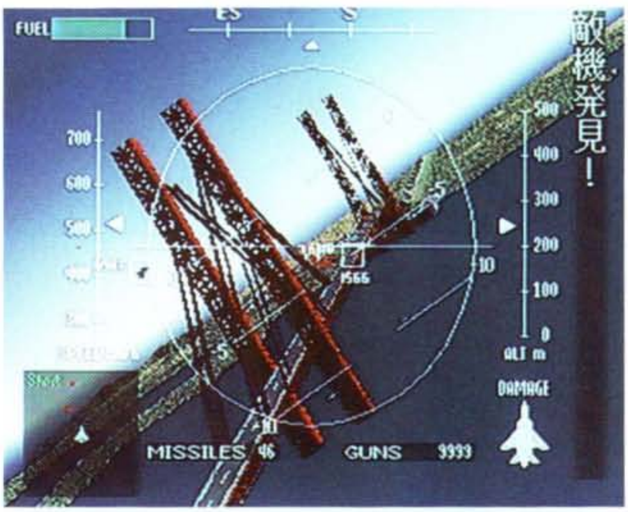




Sho has a finite number of magical attacks offering a variety of different effects

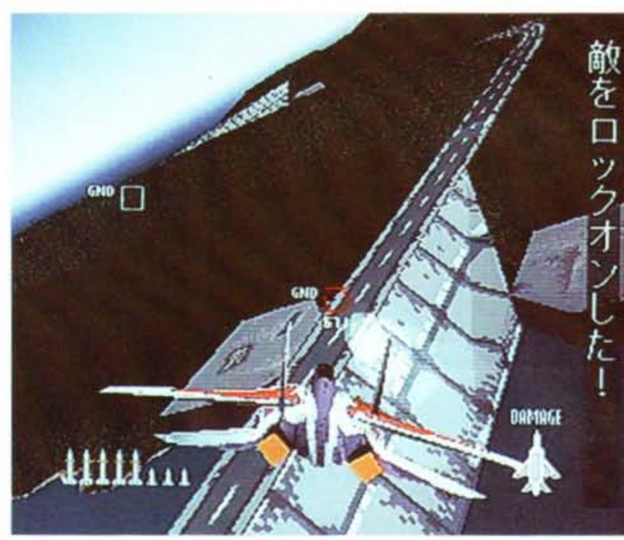
Ace Combat

With another coin-op conversion waiting in the wings, Namco's role in the PlayStation's future is proving crucial



There are two views available in *Ace Combat*: behind the aircraft (right) and inside the cockpit (above). The cockpit view gives access to extra information such as altitude and fuel levels

Format:	**PlayStation**
Publisher:	**Namco**
Developer:	**In-house**
Release date:	**June 30 (Jap)**
Origin:	**Japan**





The PlayStation game includes a wider variety of landscapes to fly over than its arcade antecedent







A choice of 16 aircraft (top) will be available. Missions will sort out the men from the boys

Namco's fifth PlayStation game is already in the pipeline, less than six months after the release of the hardware. *Ace Combat* is yet another conversion from the firm's stable of 3D coin-ops. Although it has received a name change in Japan (the arcade game was known as *Air Combat*) it's likely that the European version will retain the original title. In the arcades, *Air Combat* has recently been superseded by a vastly more sophisticated sequel, *Air Combat 22* (**Edge** 20), which uses an advanced version of the *Ridge Racer* technology called System Super 22.

Like the coin-op, *Ace Combat* includes a series of missions, but it has been given extra depth, a progressive storyline and less linear gameplay. There are now 16 different aircraft to choose from, a wider selection of ammunition and weapons, and mission briefing and map screens to give the player a strategic overview.

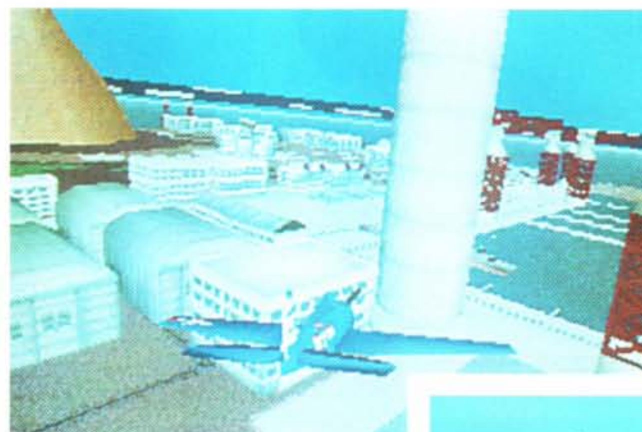
The PlayStation title also boasts smooth, texture-mapped environments rather than the coin-op's barren, flat-shaded polygons. This alone should ensure that it attracts attention when it goes onsale in Japan at the end of June.

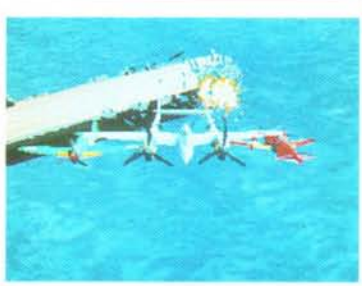
Wing Arms

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**In-house**
Release:	**July**
Origin:	**Japan**

With PlayStation *Ace Combat* on the horizon, Sega's new World War II shoot 'em up needs to be a high-flier









All aircraft are prop-driven, in keeping with the game's WWII theme (middle). A cockpit view is selectable (above)

Although not explicitly described as a conversion of the 1994 coin-op *Wing War*, *Wing Arms* on the Saturn bears more than a few similarities to Sega's Model 1-powered polygon flight sim.

After selecting one of seven World War II aircraft, including a Spitfire and a Mustang, you either press on into 'Mission' mode or opt for 'Versus' – which is not, unfortunately, a multiplayer experience but instead involves a straight dogfight to the death with a computer-controlled opponent.

The tasks in Mission mode vary wildly, with set goals including the interception of a convoy, the destruction of opposing ships, and a relatively straightforward seek-and-destroy affair aimed at a ground target.

The game's polygon environments are surprisingly heavy with detail, and the weight of texture mapping is sure to have an adverse affect on the speed of graphical manipulation in the game. But flight sim devotees will argue that gameplay is where it's at, and if Sega can transfer at least the marvellous flying feel of *Wing War* to the Saturn, it will have another important 3D title in its console library. E







Few Saturn games can compete with *Wing Arms'* level of detail (top). A choice of three aircraft is available

Played in **Japan**

The next wave of Far Eastern RPGs



Japan has had huge success in exporting its videogames culture around the globe. But one genre has stubbornly refused to travel. **Edge** looks at the latest developments in Japan's long-running love affair with the RPG

The staple component of Japan's national videogames diet is a genre that is as far removed from Western tastes as any of the nation's famously idiosyncratic tendencies. Shoot 'em ups, driving games and strategy titles are popular enough, but the mainstay of the Japanese games industry is undeniably the RPG. The attraction is such that, on the release of a particularly long-awaited title, potential buyers camp out in shop doorways overnight, and by morning queues of eager gamers can be seen snaking around the blocks of the major consumer electronics districts. At one stage the situation got so out of hand, with so many children skipping school and even respectable business types taking time off work to get their hands on the latest big release, that the government placed restrictions on the marketing of certain titles, stipulating that henceforth they could only be launched on a Sunday.

RPGs have permeated deep into Japanese culture, with many games crossing over into mainstream entertainment. Launches are backed by the lure of big-name pop stars; the games themselves are designed in part by the biggest creative pesonalities of the comics and animation world; and, as with any other entertainment product, television and press campaigns are used to build awareness.

To Westerners, however, their appeal is notoriously difficult to fathom. Gamers

Continued



Classic action RPGs: *Y's I* and *II* (PC Engine) and *Zelda: A Link To The Past* (SFC)

Arc The Lad (PlayStation)



Mirroring Square Soft's recent Japanese Super Famicom hit, *Chrono Trigger, Arc The Lad* uses side-on and pseudo-3D views as well as straightforward overhead perspectives

With hundreds of richly detailed locations, a soundtrack specially recorded by the LPO, and gameplay that looks like rivalling even Square Soft's famed 16bit RPGs, *Arc The Lad* is one of SCE's most ambitious PlayStation projects yet.

The man behind the game is **Toshio Tsuchida** of developer G-Craft (he also produced acclaimed SNES shoot 'em up *Assault Suits Valken* for NCS). 'RPGs should enable a player to enjoy any given situation,' he says. 'There's not much fun in moving around programmed characters, worrying about their attack and defence power, so we've introduced a new system called Field Battle System.'

This routine allows the game to flow more realistically. Says producer **Ryouji Akagawa**: 'In previous RPGs, when something happens, there's a scene to explain the situation, then a battle scene. *Arc* doesn't have that – battle scenes start very smoothly.'

Arc also makes novel use of the PlayStation's memory card facility. The game will be produced in two parts, with the sequel appearing later this year. When you've finished part one, you'll be able to carry over all saved details to the second.



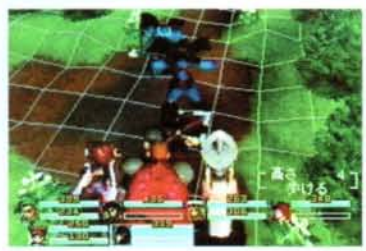
Arc's circle command system is clearly borrowed from *Secret Of Mana* (top left). Rich graphical touches are abundant (above left). The merry band meet a tree spirit (above right)

Japanese **RPGs**

Riglord Saga (Saturn)



Glorious use of 3D (above). During battles, a grid is laid over your current surroundings (right)





The female contingent of your party can magically alter a landscape's relief

Riglord Saga is part of the first wave of Saturn RPGs, along with Sega's own *Virtual Hydlide*. But whereas *Virtual Hydlide* uses a fixed 3D into-the-screen perspective, *Riglord Saga* adopts an overhead view which zooms and spins to follow the action.

The result is an attractive-looking game with a unique hilly landscape whose many vantage points provide an extra strategic element. Certain characters even have limitations that force them to keep to low ground – Hector, for example, can't climb hills because of a claimed bad back!

Those familiar with the Mega Drive's *Shining Force* series will find *Riglord Saga*'s control and combat routines familiar. Movement is a step-by-step affair, conducted with the aid of a grid superimposed over the play area, and combat is handled in a similar fashion. Unfortunately, the innately stilted nature of this system could limit the game's appeal.

But with over 150 forms of attack, a vast range of environments and plenty of spells, *Riglord Saga* will prove an interesting prospect for those willing to take it on.





Riglord Saga **features many interior scenes, all presented using texture-mapped polygons, (above left). As in many RPGs, snowy wastes form part of the playing area (above right)**

Continued



accustomed to computer RPGs (a trend which began in the late 1980s with 3D maze-based titles such as Electronic Arts' *The Bard's Tale* and FTL's *Dungeon Master*) often find the nuances of Japanese-bred roleplayers uncomfortable and unwieldy. Instead of firstperson-perspective adventures, the norm is thirdperson-viewed games like the *Dragon Quest* series (the most popular RPG in Japan in sales terms), which have only tenuous links to the Western concept of the RPG.

The entertainment in such games is not derived from roaming 3D mazes, collecting gold and treasure and slaying characters in order to build experience levels, but from following the convoluted tales of a vast cast of heroes, heroines and villains (each of which has his/her unique character traits) through a bewildering variety of locations and situations. As well as engaging in hours' worth of turn-based combat, characters experience personal hardships and dilemmas; they fall in love, suffer illness, and build relationships with those around them. Rather than being determined solely by the player himself, the direction of such games is relatively preordained, which has led them to be tagged 'interactive novels' – a term that has done nothing to endear them to already dismissive Western gamers.

The West is only slowly becoming more receptive. Nintendo's *Zelda* games (on the NES and SNES) are the best-known champions of the cause to have found their way into homes this side of the hemisphere. But, as indubitably first rate as they are, they're action-based games at heart and not true representatives of the RPG genre.

Final Fantasy III (the US translation of *Final Fantasy VI*, the latest in the series in Japan) is, however, the real deal. It has all the hallmarks of the classic RPG, including a complex combat system, comprehensive party management, and magic items and spells by the cauldronful. It was the eighth biggest-selling SNES cart in the US in 1994 – and it only went onsale in the fourth quarter of the year. But it's still way behind the likes of *Mortal Kombat II* and *Donkey Kong Country*, both of which, ironically, paled against *FFIII*'s performance in Japan.

The genre's potential outside Japan has been bolstered by the decision of Square Soft, the creator of *Final Fantasy*, to go it alone in the States and create an RPG using American staff, American development techniques and – perhaps misguidedly –









Square Soft's HQ (top) and, clockwise from above left: *Chrono Trigger*, *Secret Of Mana* and *Final Fantasy III*

American folklore and traditions for its background and storylines. The result is *Secret Of Evermore*, a game that steals much from Square's much-admired *Secret Of Mana* and is due for release later this year. And it's no secret that Enix has recently been combing the UK's development community in search of potential partners for a European push.

But it's in Japan where the real activity takes place, and in such a lucrative market, competition between the main players is fierce. When Square Soft announced its new RPG, *Chrono Trigger*, arch-rival Enix was quick to counter with news of a new instalment of *Dragon Quest*, bombarding Japan's gaming press with taster shots and snippets of information. The game wasn't due to appear for several months, but keeping up with its competitor was as much a priority for Enix as serving its consumers.

And this rivalry shows no sign of letting up: Enix has just released the first details of its latest game, *Mystic Ark*, and, sure enough, Square countered with information about the long-awaited sequel to *Seiken Densetsu 2* (known as *Secret Of Mana* in the West).

A steady stream of mediocre efforts from other publishers has made life relatively easy for these two companies – if, indeed, the term 'easy' could be applied

Continued

Seiken Densetsu 3 (SFC)







Square's typically high graphical standards prevail (above and above right). Flammie makes a welcome return (right)

Square Soft's *Secret Of Mana*, (otherwise known as *Seiken Densetsu 2*) has an unparalleled reputation among discerning SNES RPG fans. It combines the accessibility of *Zelda: A Link To The Past* with the intricacy of the *Final Fantasy* series to astonishing effect.

And now its sequel looks like capitalising further on that winning formula. The latest instalment of the game has a playing area three to four times the size of the original's, and offers six selectable characters rather than the three available previously.

The simultaneous threeplayer facility remains (via a multitap), but Square has also taken into consideration the needs of solo players – non-playing characters are now imbued with extra artificial intelligence for less hasslesome play.

Other significant changes include day-to-night transitions (and their effect on monster encounters, etc) and a new battle system which allows for even more logical fighting.

Seiken Densetsu 3 is shaping up to be another classic action RPG from the leader in the field.









Square Soft has excelled itself with the game's bosses (top left and right and above left). The characters selected from the six available affect the course of the quest (above right)

3DO developers: **Micro Cabin**



Micro Cabin has made a name for itself with its swift 3D routines on the 3DO. The interior sections of its new RPG (above left and top right) feature intricately detailed objects and furniture. The combat sections (above right) are reminiscent of Bullfrog's *Populous*

Of all the next-generation machines, the 3DO is the most undernourished in terms of RPGs. Micro Cabin's *The Life Stage* and *Power's Kingdom*, both released last year, are the only examples of the genre to speak of, but their generally dull gameplay is a poor advertisement for the Japanese developer.

Now the company is looking to build a more solid reputation with another 3DO venture. The project – which is still unnamed – uses polygons but eschews the style of existing 3D RPGs on the 3DO, such as the popular *Alone In The Dark* and *Dr Hauzer*, preferring instead to follow a more traditional Japanese path.

'The engine in this game is much more powerful than that of our first project, *The Life Stage*,' says Mr **Nagai**, chief programmer on the project. 'The graphics, including the maps and all of the buildings' interiors, are all in 3D. Of course, the viewpoints change freely, and the result is like a 3D version of former 2D RPGs.'

'The 3D graphics are reminiscent of *Populous*,' he continues. 'The graphics will switch to battle mode when enemies appear. In the battle scenes, magical effects are gorgeous – create an earthquake, for example, and a big hole will appear in the ground which you can throw enemies into.'

So, unlike *Arc The Lad*, the Micro Cabin project is obviously designed to drag the genre into the next generation through its presentation, while clinging firmly to established RPG values in its gameplay.

Although still some way off completion, the game is progressing steadily, with smooth, detailed environments and a fluid battle system already in place. 3DO owners will be banking on core gameplay to match the graphics.



Micro Cabin's first 3DO title of note was *Power's Kingdom* (known as *Guardian War* in the West). Sadly, its colourful characters were overshadowed by severely humdrum gameplay

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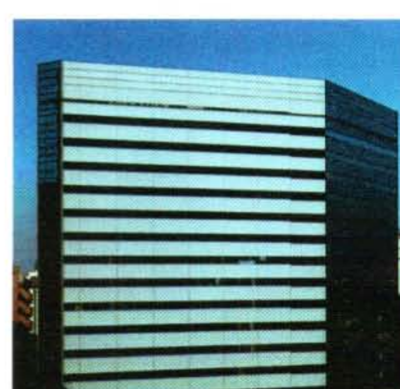


to the work of either firm. Major RPGs are huge undertakings: 'It can take up to two years to decide upon some of the finer aspects of the game,' admits Enix's Mr **Futami** (producer of many SNES games, including *Actraiser*). Square's Japanese office houses some 264 employees, with about 80% of its staff dedicated directly to software development. The most recent instalment of the *Final Fantasy* series came to life thanks to the efforts of a 40-strong team, and it has a reputation among devotees as one of the most beautifully designed and absorbing videogames ever made.

Despite – or perhaps because of – the success of RPGs on 16bit platforms, the genre is only just beginning to figure among next-generation titles. With such a solid installed userbase of 16bit machines, Japan is not as quick to discard existing technology as the West. Square Soft, for one, is playing it safe: 'We are confident about the Super Famicom format,' says the company's **Mie Mizushima**. 'We want to wait a while to see what direction the market will develop in order to get involved with any particular new platform.'

Enix expresses similar beliefs: 'There have only been 500,000 Saturns and PlayStations sold, and in business terms these figures are too small for us – when we're releasing *Dragon Quest* games we're looking at selling around 3,000,000 cartridges,' says Futami.

One thing is clear: the differences between next-generation RPGs and 16bit





Enix's Japanese HQ (above). The firm first enjoyed success on the SNES in the West with *Actraiser* (left)

ones will not be as obvious as the changes already seen in other genres. Tried and trusted game engines are being cloned to form the backbone of titles like SCE's *Arc The Lad*, and the overhead viewpoint remains dominant. The new wave will benefit primarily through rich backdrops, clever spot graphical effects and, perhaps most of all, enhanced soundtracks.

'It's become popular recently for real orchestras to play music to be recorded on CD, but in *Arc The Lad* we did the opposite,' says producer **Ryouji Akagawa**. 'The London Philharmonic Orchestra played the music which Masahiro Ando composed, and we'll be putting that straight into the game. The PlayStation can play 24 sounds simultaneously, and we've made the best use of this.'

'It would have been easier to create a 3D world with 3D graphics, but we wanted to express depth with 2D graphics,' claims **Toshio Tsuchida**, the independent director of the project, who produced *Front Mission* for Square earlier this year. If his feelings are representative of the RPG industry in general, well-realised traditional bitmap games look likely to continue to dominate for some time.

'If we use polygons in RPGs the games will become nicer to look at, but the content will not change,' asserts Futami. 'We don't think the basic systems of RPG systems will change just because developers are utilising polygons.'

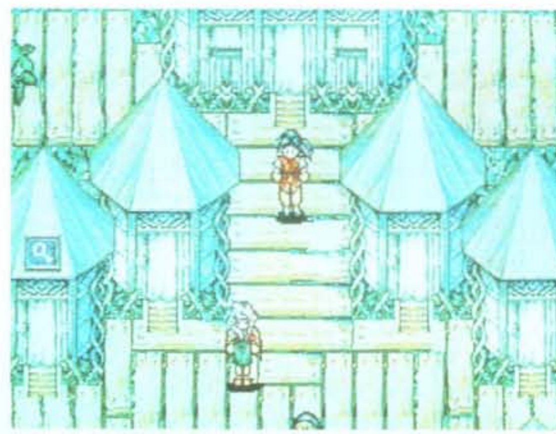
Given the long development periods for 16bit games, and the fact that up to 40 people are involved in each project, it's easy to see how even the giants of the trade might be frightened off by the extra workload resulting from moving into 3D territory. Enix will admit, however, that it's willing to experiment on established platforms. 'We did something of a trial with a game called *Project J* on the SFC in December,' says Futami.' It was a cross between an RPG and a simulation, with the player not controlling the hero himself, but using an elf character as a guide. We've sold 1,300,000 copies in Japan, so it's been a success. We're also diversifying with *Mystic Ark*. It's going to be a mix of puzzle – similar to the puzzle sections of *The 7th Guest* – and standard adventure game.'

Although the future of Japanese RPGs looks decidedly hazy at present, two things can be predicted with some certainty. The first is that RPGs will retain the interest in Japan that has seen them achieve an unassailable position in the market. The second is that, whether the West is yet wholly convinced if it wants them or not, they're heading this way… **E**

And the rest…







Clockwise from top left: *Fujimaru* on the PlayStation uses a subtle colour palette and some strong strategy elements; Sony Computer Entertainment's *Wizardry VII* continues the popular PC series on the PlayStation; Japanese RPG giant Enix is currently putting the finishing touches to *Mystic Ark* for the Super Famicom; Konami's *Suikoden* is, along with *Arc The Lad*, one of the more traditionally realised RPGs scheduled for the PlayStation; Enix is banking on the SFC's Famicom *Dragon Quest VI* replicating the phenomenal success of all five of its respected forebears







Clockwise from top left: Sega's *Blue Seed*, due on the Saturn shortly, is based on the popular Japanese anime of the same name; *Shining Wisdom* (Saturn) is being programmed by Sega's Sonic Team, and pays tribute to ARPGs such as *Zelda III*; *Magic Knight Ray Earth* (Saturn) uses colourful anime-style characters as its protagonists; *Lunatic Dawn*, an isometric RPG on the NEC PC-FX, is one of the first non-anime footage-based games for the machine; Square Soft USA's *Secret Of Evermore*, its attempt to produce a Japanese-styled RPG for the American market



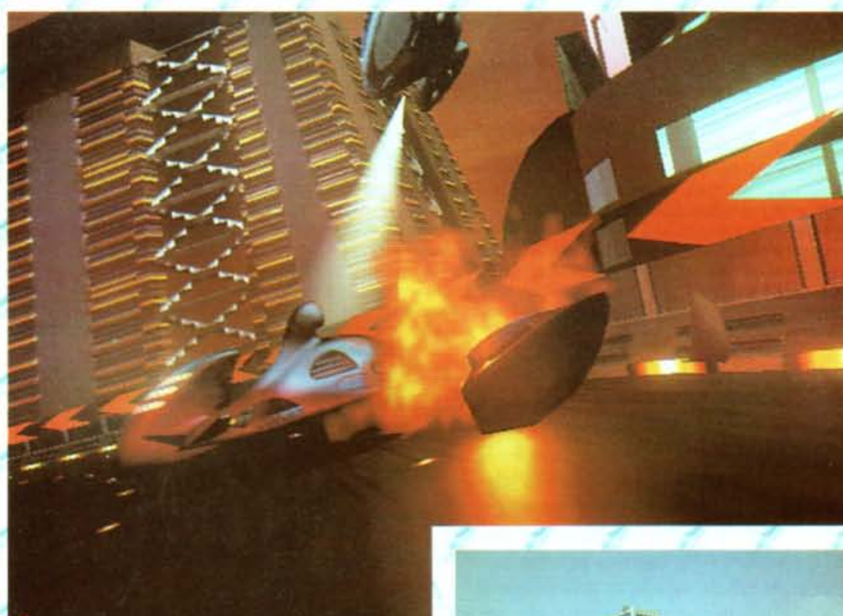
Just two years after the launch of its first licensed console, 3DO is gearing up for a second attempt to conquer the videogames world. With M2 development now at a crucial stage, **Edge** reports on the machine that could make or break 3DO

3DO's second coming

In March 1993, Trip Hawkins embarked on a mission: to make 3DO a consumer electronics standard, as common as the VHS VCR and the CD player. But two years later, while the PC becomes increasingly established as the de facto videogames standard, the 3DO still languishes in no man's land. Now Hawkins is trying again.

When M2, the second-generation 3DO machine, arrives in the shops later this year, it will be the most powerful set of silicon ever available to the home gamesplayer. With a PowerPC 602 chip supported by ten co-processors, 6Mb of memory, on-chip MPEG1 and a 528Mb/second bandwidth, the machine is claimed by 3DO to be 50% faster than Sega's Model 2 arcade board, seven to ten times more powerful than the PlayStation, and significantly faster than the (now delayed) Ultra 64.

3DO's confidence in its system's abilities is apparently shared by its hardware manufacturers. 'All of our existing hardware partners are supporting the M2 project,' claims **Sharon Leah Grimshaw** of 3DO US. 3DO's association with some of the world's biggest electronics corporations – like Matsushita, Goldstar, Sanyo, IBM, Apple, Philips and Motorola – give it much more clout to push its technology into the home this time around. And 3DO is also talking to coin-op companies, which it maintains are all clamouring for exclusive arcade licences.





3DO claims M2 can produce images like this in realtime (above). The Japanese HQ of Matsushita (right), manufacturer of the Panasonic FZ-1 and 3DO's largest backer

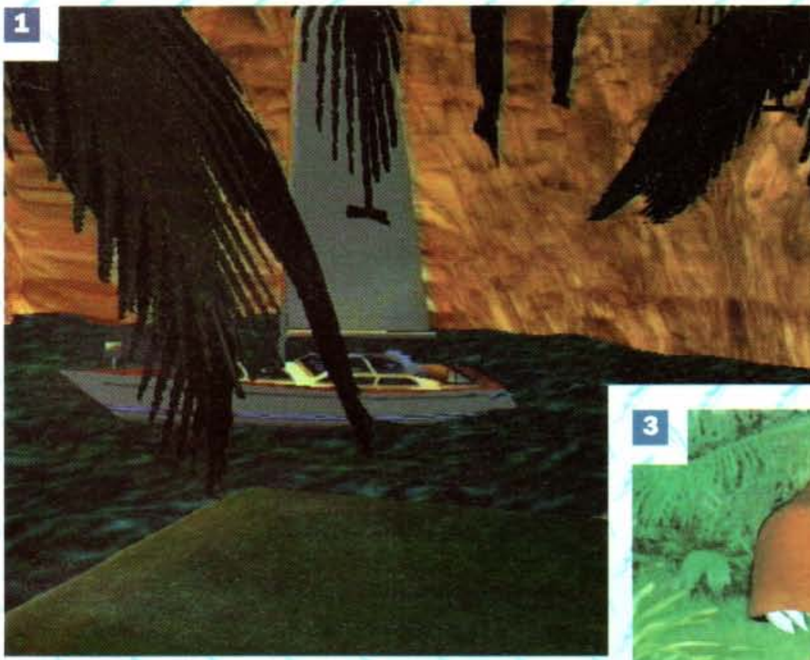
M2 is being primarily targeted at gamesplayers – lessons have been learned from 3DO M1, which was pushed as a multimedia player – and its success ultimately rests in the hands of the games developers recruited by 3DO.

If 3DO's performance claims are correct, the machine has definitely got the power to satisfy developers. 'One of the biggest frustrations for a game creator is watching a great game crushed by inadequate system performance,' says **Mark Cerny**, vice president of technology at Universal Interactive Studios. 'With the M2 that will no longer happen – we are entering an era where the primary limitation will be our imaginations.'

But 3DO is strictly limiting who gets to exploit this power. Only 12 developers – the much talked-about 'Dream Team' – will initially have access to the technology. A second group of developers – 'Team Alpha' – will then be offered a chance to work on the machine, with the remaining

Continued next page

3DO M2 feature







The official 3DO video shown to developers (and Edge) reveals the areas in which M2 excels. 1 M2 will be the only console apart from the Jaguar to offer hardware z-buffering, removing the need for time-consuming and imperfect software routines. 2 M2's MIP mapping (a maths-intensive interpolation routine used to provide smooth texturing as an object moves close to the camera) uses different-sized texture maps depending on the position of the object. 3 M2's shading is so smooth that the joins between the polygons are invisible. Some developers have expressed concern that the graphics are *too* real...

Continued

companies who want a stake in M2 being able to start titles later this year.

One member of the Dream Team is Interplay. Executive vice president **Dick Lehrberg** describes the M2 in glowing terms: 'The M2 and its revolutionary design and groundbreaking features provide us with an excellent vehicle to deliver our software to consumers and meet our goals to stay on the leading edge of this fast-paced industry.'

Many other developers have made similar statements – everyone who has seen the M2 emulation in action has been impressed with its performance. But, regardless of the power at their disposal, developers face a tough time if M2 is to have, as **Greg Richardson** of 3DO intends, 'at least a dozen major hit titles finished in time for launch – no *Mahjongs*, no *Motor Toon GP* and no *Putt-Putts*.'

3DO's problem is that, unlike the Saturn and PlayStation – and like the original machine – it may have no 'killer app' at launch. *Virtua Fighter* and *Ridge Racer* had already been gameplay perfected in their arcades. In contrast, the members of M2's Dream Team have only six months to create games from scratch that can sell the machine. It's an ambitious task.

To ensure steady, longterm success from the start, developers will require a sizeable userbase. And the paramount factor in getting M2 into homes is price. 3DO M1 started slowly due to its $699 tag, and has found it difficult to shake off the 'failure' label ever since. The machine also had to contend with the fact that it was launching into a non-existent market. There were still many excellent 16bit games available, and it found it hard to persuade gamers that a 32bit system offered anything significantly better. But, ultimately, price was the most fundamental consideration. 'One thing people don't appreciate is the importance of price to the mass market in this country,' said **Tom Kalinske** in **Edge** 20. 'The US has always been very, very price driven. It all comes down to price.'

3DO maintains that the PowerPC technology offers an extremely competitive power to price ratio, arguing that because of its links with the multi-company PowerPC consortium, it can ride on the coattails of a larger overall investment. But when it comes to a specific price, it is keen to point out that 3DO itself does not set hardware prices. 'We deliver the lowest cost possible to Matsushita, GoldStar and the other hardware partners,' explains Grimshaw. 'They in turn manufacture and sell the 3DO units themselves.'

And this laissez-faire philosophy is the key to 3DO's plans. The PC has established itself in nearly 50 million homes around the world without any combined marketing effort from manufacturers. Individual hardware companies compete directly with each other to provide the best possible

3DO's problem is that, unlike the Saturn and PlayStation, it may have no 'killer app' – no *Virtua Fighter* or *Ridge Racer* – at launch

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4 The dinosaur head has been filtered – a technique similar to anti-aliasing which softens hard edges on an object. 5 M2's alpha channel will be extensively used by programmers wishing to experiment with new effects. In this *Virtua Fighter*-style arena, a fog effect makes the players appear less distinct as the view zooms out and clearer as the camera closes in. 6 The velociraptor takes on a human fighter in an impressive display of polygon shifting. Most of M2's 3D games are likely to feature Gouraud shading. 7 MIP mapping and filtering can enhance picture quality dramatically, as shown by these before and after views: in the top picture the fence is ugly and pixellated, while in the bottom, effect-laden shot it's smooth and realistic – the result of the M2 hardware being pushed to the limit

deal for the customer, relying on bulk sales to compensate for profit margins that are often less than 5%. Trip Hawkins' business plan calls for Panasonic, Lucky Goldstar, Samsung, Sanyo, Grundig and any other licensee to fight each other for sales. The hoped-for result: low prices, stylish design and happy customers willing to buy the hardware and spend on software.

'I think it's safe to say that companies like Matsushita and GoldStar have learned that to earn market you don't launch at $700 or even $500,' says Grimshaw. 'They now understand that to make the market, to be successful and to beat Sony – who they are after at this point – they are going to have to come out at a price that is competitive. Where do we think that is today? Well, let's just say we doubled our installed base, in one quarter, at $399.'

So $400 is 3DO's magic number. But with the PlayStation launching at $300 in the US and Nintendo sticking to a 'below $250' projection for its Ultra 64, M2 could well find itself priced out of the market – just like the original 3DO.

Certainly, SCE's **Steve Race** isn't admitting to losing any sleep over M2:

'Even if you suspend disbelief in a lot of areas, Trip has probably sold less than 500,000 units – in over a year. That's not a resounding success'

Steve Race, Sony Computer Entertainment

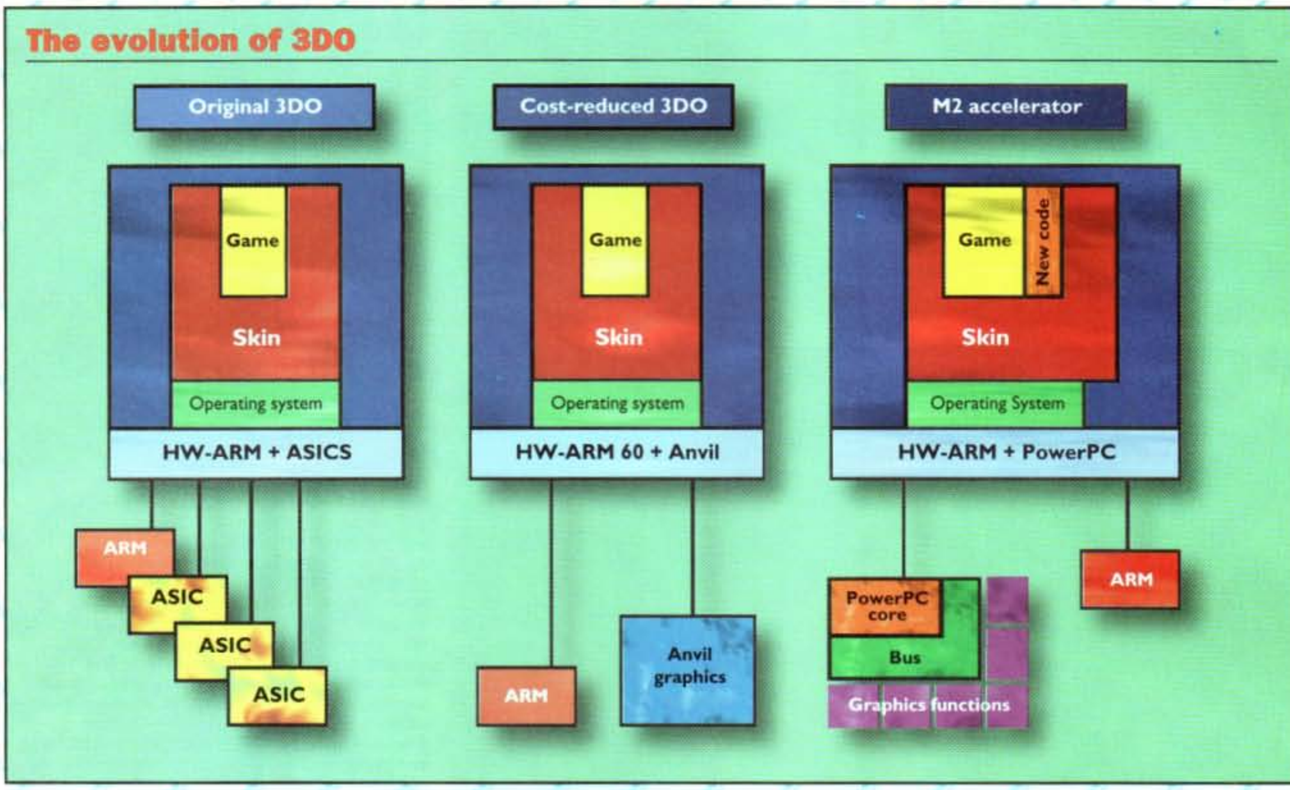
'Remember that we're talking about specs, and anyone can write down specs on a piece of paper. What's the price going to be? How's it going to be distributed? You also have to look at the bigger 3DO picture. Even if you're going to suspend disbelief in a lot of areas, worldwide Trip has probably sold less than 500,000 units – in well over a year. That's not a resounding success. He probably has installed in the US somewhere between 80,000 and 150,000 pieces. That's not a lot of units and I think that as far as retailers are concerned, when you start to smell like three-day-old fish, you *are* three-day-old fish.'

As well as price, another question that will determine M2's success is compatibility. The machine will slot into the AV expansion port at the side of all current 3DOs, but precisely how important the original components will be is not yet clear. M2's OS contains many of the same calls as the original, and the CD-ROM drive will be reused, as will some data paths, but the vastly superior technology of M2 renders much of the initial hardware obsolete. M2 uses a different memory sub-system to 3DO M1 (SDRAM instead of DRAM and VRAM) and the 64bit architecture and wide bandwidth mean that, effectively, an entirely new machine is being added. It is certainly more than just adding a few extra, faster chips to the existing box.

Although system upgradeability is generally regarded as a good thing by developers (where would the PC be without it?), the customer's view on the subject is rather more hazy. The thought of having to re-invest so soon will surely not be relished by current 3DO owners, and they will take some convincing that upgrading is worth their while.

Continued next page

3DO M2 feature



The 3DO has undergone several improvements already, but the arrival of M2 will radically change the machine's architecture. The addition of the PowerPC 602 chip, a greatly widened bus and a total of ten co-processors will make for a substantially different piece of hardware

Continued

Attempts by developers to reassure consumers have already begun. 'All our existing 3DO titles will run directly on M2,' argued one M2 convert. 'More recent titles will detect the presence of M2 and will use the additional features.'

Be that as it may, 3DO is taking a risk. It is expecting gamers to fork out an extra $200-400 to keep it at the cutting edge, a considerable expense when you consider that – by the firm's own admission – more than half of 3DOs will be less than 12 months old when M2 arrives.

One ostensibly trivial but ultimately crucial aspect of the new machine is the redesign of the joypad. The original pad came in for a lot of criticism from gamers and developers alike. 'Not exactly a work of art, is it?' admitted 3DO's **Greg Reynolds**. 'Unfortunately, it was Panasonic's first foray into videogames. They are working to ensure that the M2 controller has none of the original's problems.' Certainly, a comfortable SNES-like pad would be a major point in M2's favour.

The 3DO Company has completed the first stage of its three-phase run-up to the launch of M2. It recently received the finished custom chips for testing, and they're all running according to plan. Once the company is satisfied that the operating system works with the hardware, the first development stations will be shipped.

Next, sometime during the summer, 3DO plans to announce final configurations, confirmed hardware and software partners, and launch titles. The final phase will focus more on marketing than software development, and will include launch details, distribution, and, crucially, M2's street price. M2 will then hit the shops in December this year.

3DO is expecting gamers to fork out an extra $200-400, even though more than half of 3DOs will be less than 12 months old when M2 arrives



The M2 development system with its guts exposed. First games arrive in six months

'The bottom line for 3DO is that we do not believe that a closed system will ever win,' states Greg Reynolds. 'If this market ever wants to grow beyond a toy industry then the necessity for a standard is paramount.' 3DO evidently believes that its new system will succeed where 3DO M1 failed. Whether Trip Hawkins' vision of a global videogames standard is to be realised won't become clear for some time yet, but 3DO is certainly going all out to make it happen.

M2 tech specs

Highlights

- 1 million polygons per second
- 100 million pixels per second
- 10 custom co-processors
- 528Mb/second bus bandwidth

CPU

- Custom PowerPC 602 RISC chip @ 66MHz
- 32K instruction and data caches
- 132MFLOPS per second floating-point maths processor

Memory

- 48Mbits (6Mb) of SDRAM and ROM
- 64bit memory sub-system bus to facilitate rapid movement of data
- Cache-coherent memory system
- Game saving: internal non-volatile memory plus storage cards

Graphics

- Resolution: 640x480 in 16bit;
- 320x200 in 24bit
- Full-motion video capabilities
- MPEG 1 video built in as standard
- MPEG video supports JPEG decompression

Custom graphics

- Texture mapping: destination-based rendering
- Hardware texture decompression
- Linear, bi-linear, tri-linear and point-sampled filtering
- MIP mapping – multiple detail levels
- Gouraud shading on RGB and alpha channels
- 3D perspective correction
- Hardware z-buffering
- Alpha channel special effects (eg fog and transparency)

Sound

- 66MHz DSP
- 32 channels with hardware decompression and interpolation on all channels
- MPEG audio decompression
- 44.1KHz (CD-quality) sound

Testscreen

This month the PC proved it can still compete with whatever the consoles can throw at it. *Full Throttle* is very polished, and *Flight Unlimited* is a joy to behold (on a P-90).

Platform games arrived in three different guises this month. *Jumping Flash* is innovative but too short; *Astal* is let down by its gameplay; and *Gunner's Heaven* is spectacular but dated.

Slam 'n' Jam is playable, but *Burn Out* is the sort of game the Jaguar can do without.

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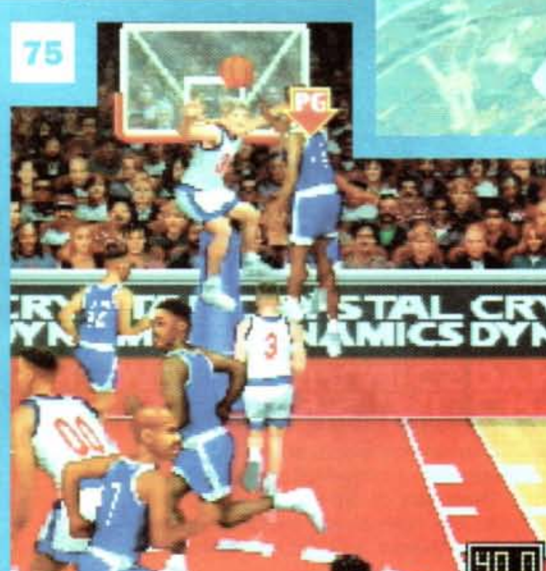
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64



75



Jumping Flash

Format: PlayStation
Publisher: SCE
Developer: In-house
Price: ¥5800 (£45)
Release: Out now (Japan)





Jumping Flash **offers more than novelty visuals. Because of bosses like this (above), it looks unusual and dramatic, but the gameplay also works well, proving that the 3D platformer is a viable concept**







Hopping from balloon to balloon (top) can be a frustrating experience. The third level boss (middle) is a challenge, but the fourth one (bottom) is easier

The first six months of the PlayStation's existence has been distinguished by games derived from existing genres: racing games, beat 'em ups, shoot 'em ups, scrolling platforms games, RPGs and so on. Sony's technology has enabled these games to be presented in an aesthetically pleasing manner, but so far none has really added anything unique to their respective genres.

Jumping Flash is the first title to take an age-old game style and really shake it by the throat. Admittedly, it is a platform game – the oldest genre in the book – but this is as far removed from *Donkey Kong* as *Donkey Kong* was from *Pong*.

Star of the show is Robbit, a robotic rabbit, and it's through his pink eyes that the gameworld is viewed. Each level is essentially a three-dimensional island – or group of islands – floating high above a cloudscape. These islands are littered with buildings, towers, hazards and creatures indigenous to each themed area. On area three, for instance, you have rollercoasters and a Ferris wheel; on world four, there are snowmen, penguins and igloos. The idea is simple: Robbit has to retrieve four carrot-shaped jetpods which have been secreted about the level. As you progress through the game, they're hidden in less accessible locations.

Robbit, as expected, jumps around. One button tap sends him skywards; another tap at the peak of his trajectory sends him even higher. At this point Robbit looks down between his oversized feet to give the player some idea of where he's going to land.





Pick up the invulnerability power-up (left) and go psychedelic for a while (right)





Much of the time you find yourself peering down between your feet at the ground below (above). Soaring above a giant ice castle (top right)

And that, apart from some perfunctory shooting, is it. Once all four jetpods have been collected, Robbit is directed to the exit pad and blasts off to the next stage.

Jumping Flash is a clever idea, brilliantly executed. The depth-cued 3D graphics are wonderful, capturing all the right sensations of height and distance. They're also mostly glitch free and seemingly rendered with ease. Nothing a high-spec PC couldn't handle, but impressive nonetheless.

And as well as being a demonstration of the PlayStation's graphical prowess, *Jumping Flash* actually plays very well. Platforms are cunningly positioned so that you often have to make daring leaps into space, landing with the merest of margins. And much has been made of the 3D aspect, with platforms suspended hundreds of feet in the air, requiring some nimble athletics to reach them.

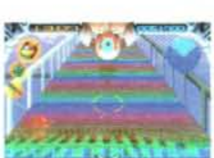
However, the enjoyment is a little too short-lived. Four of the six worlds (three levels in each) can be bested in a day's play, and the later two are only problematic thanks to over-zealous enemies and hardened bosses. With the opportunity to save game positions to the memory card, only the most joypad-inept gamers will struggle to complete the entire game in a few days.

As an enjoyable, enthralling gaming experience, *Jumping Flash* is without equal. But, like a suspiciously high number of 'next generation' titles, it's a long way from being a worthwhile investment. It's a shame that there are no secret stages or unusual tasks to perform. And, given the amount of storage space liberated by the CD revolution, the fact that it has just 12 distinct, complex levels (the remainder are much more straightforward boss stages) means that gamers would be right to feel short-changed.



There's a wide variety of 'monsters' to be dispatched, all of which vaporise in a colourful display after a few hits (middle). Collect four of these jetpod carrots (bottom left) to activate the level exit (bottom right) – you are a rabbit, after all





The fairground level offers stunning views (left) and trippy conveyor belts (right)



Clockwise from top left: *Jumping Flash*'s platform origins; bounce on this monster, *Mario*-style; fans propel you upward; eat that carrot

Edge rating: **Seven** out of **ten**

Gunner's Heaven







Format:	PlayStation
Publisher:	SCE
Developer:	Media Vision
Price:	¥5800 (£45)
Release:	Out now (Jap)







Your standard weapons can be charged by collecting the energy pods left behind by felled nasties (top left). A robotic scorpion grabs you and prepares to deliver an electrical shock (top right). The mine level, which finds you on skates, is particularly tough (above left). The game is full of cribbed elements (above right)





From top to bottom: typical Japanese mecha design features throughout; a pretty, if unoriginal, backdrop; this boss flails wildly; another of many rotating enemies

Gunner's Heaven is a platform action shoot 'em designed to show off the PlayStation's sprite handling. It's not a game bursting with originality, but what it does have is a comprehensive range of over-the-top weaponry, hordes of nasties and plenty of imaginative boss characters. In a typical chunk of one of the six levels, you have to run from left and right, taking out mid- and end-of-level bosses. To add spice, there's also the occasional vertical scrolling section, plus and skating and flying levels.

Media Vision seems to have set out to clone a state-of-the-art '80s coin-op, and that's precisely what it has done. Success in each level depends on playing it through, learning when and where everything appears, and then going back mentally equipped for another crack. Coin-op connoisseurs will appreciate its old-school design, but anyone looking for new gameplay will be disappointed.

Gunner's graphics are mostly a disappointment, although some of the hardware effects (such as smooth sprite rotation and scaling) do their best to remind you that this is a PlayStation and not a SNES.

Unlike *Jumping Flash*, though, *Gunner's Heaven* doesn't justify its existence as a next-generation videogame. It's packed to the gunwhales with action, but it's all been seen before.

Edge rating: **Six** out of **ten**



Your character (either male or female) starts the game equipped with one special attack

Astal





Format:	Saturn
Publisher:	Sega
Developer:	In-house
Price:	¥5800 (£45)
Release:	Out now (Jap)

The 24bit artwork used in *Astal* is quite beautiful – some of the backgrounds and characters have an almost Disney-like quality. It's a pity the same care and attention wasn't lavished on the gameplay



The sheer number of sprites onscreen at any one time is quite mind-boggling in places

It's perhaps no coincidence that *Astal* was released in Japan on the same day as Sony's *Gunner's Heaven*. Despite the polygon excesses of many Sega and Sony titles, both companies are also competing to cater for the appetites of Japanese gamers hungry for 2D games.

In some respects the quality of *Astal*'s visuals puts Sony's new platform shooter in the shade. The use of colour, transparency and screen scaling gives credence to the Saturn's boasted 2D performance, although the flat parallax backdrops fall well short of *Clockwork Knight*'s solid 3D world.

But, as is so often the case, the main stumbling block is the gameplay. Unlike *Sonic*, *Astal* is a fairly sedate affair consisting of dawdling horizontal levels. Instead of using graphical innovations such as sprite rotation to provide some new gameplay twists, *Astal* merely uses them as a layer of gloss.

Sega's latest will both impress and disappoint Saturn owners. Technically it makes some gestures to the power of the machine, but it takes several steps back in terms of play mechanics. Optimists will now be pinning their hopes on future platformers *Clockwork Knight 2* and SOA's *Bug*.





Ripping this enormous plant from the ground prompts the screen to zoom out smoothly

Edge rating: **Five** out of **ten**

Full Throttle

Format:	PC CD-ROM
Publisher:	LucasArts
Developer:	In-house
Price:	£45
Release:	Out now





In the intro you meet the game's blue-chinned hero, Ben, and his motorcyclin' mates (left). For a change, the bikers are the goodies in *Full Throttle* (it's the clean-shaven businessmen who are decidedly bad)

CD-ROM doesn't, as it transpires, automatically make games better. But it can allow them to be an awful lot bigger. LucasArts evidently realises this, and *Full Throttle* – its first CD-ROM-only adventure game – fills the CD to bursting. If it came on floppy disks it would probably occupy several hundred of them and take anything up to six months to install onto your hard drive.

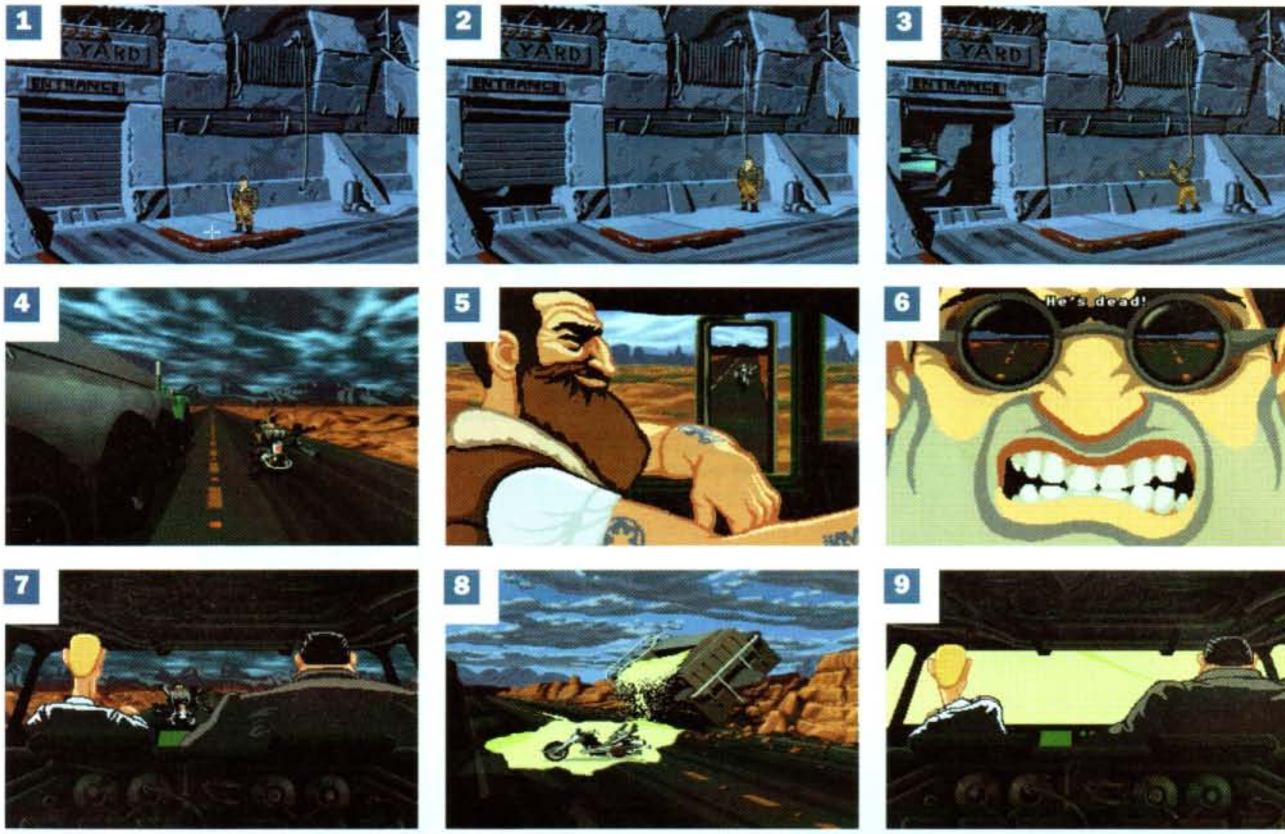


Much of the space on the CD is accounted for by speech – every line in the game is spoken, with visible text only available as an option. And this isn't the embarrassing, hammed-up dialogue that we're so often forced to endure. The characterisation is superb, with some impossibly gravelly voices, and the speech is so well synchronised with the action that the whole thing takes on the quality of a slightly pixellated cartoon.

Hundreds more megabytes must also surely be taken up by the animation. Although you'll spend most of your time cracking through good, old-fashioned puzzles (this isn't some pseudo-interactive sit-back-and-watch affair), *Full Throttle* is divided up into small chunks, with entertaining cutaways and close-up shots following the successful completion of most puzzles, and larger sections separated by lengthy animated sequences which, as well as being tremendous fun to



***Full Throttle* makes a persuasive case for an *Easy Rider, On The Road* kind of lifestyle**



1 Ben needs to get into that scrapyard to find some new forks for his damaged motorbike. 2 When he pulls the chain dangling from the wall, the door opens... 3 ...but closes again as soon as he lets go of the chain. 4 Later, with his bike fixed, he heads off in pursuit of his gang, who are unwittingly heading into an ambush. 5 But this hirsute lorry driver is determined to run him off the road. 6 No-one treats a Polecat like that. 7 Later, Ben finds himself being tailed by a couple of Ripburger's henchmen. 8 This should slow them down. 9 Ben's ruse succeeds and his pursuers promptly crash

watch, ensure that the game has a thumpingly strong storyline.

In fact, the animation in *Full Throttle* is as good as anything outside the world of videogames – the likes of *Batman: The Animated Series* had better watch out. A particular delight is the intro sequence, where, after witnessing a scene-setting exchange between a couple of shifty-looking executives in a big, futuristic hover-limo, we see Ben (your character) and his gang, the Polecats, roar past on huge motorbikes.

A little later on, we're in a seedy bar, and Ben is listening to one of his gang members complaining that they're broke. 'I have a feeling something's coming our way,' Ben reassures him gruffly. 'Something big.' The view switches to outside, the music (which is also superb throughout the game) shifts down a key and takes on a more sinister tone, and the huge limo appears again, rolling up stealthily outside the door. So much care has gone into the storyboard that *Full Throttle* is full of wonderfully cinematic, over-the-top moments like that.

The upshot of all this is that, no matter how tough things get, you become so engrossed in the plot, so caught up in the interaction between Ben and the supporting characters, and so captivated by the game's wry biker philosophy that you've got to keep playing.



Map screens help you find your way around the various locations in the game (left). Somewhere near this caravan is a welding torch which you need to fix your bike (right)

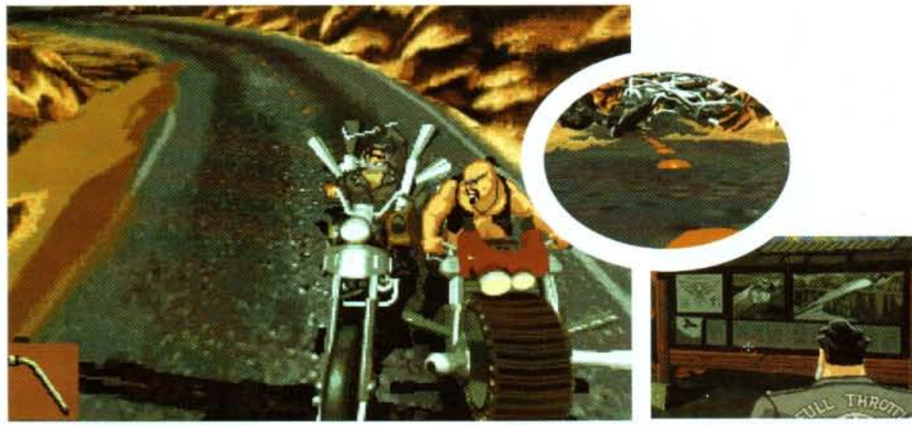
Full Throttle is in effect the first true 'road game' – a PC equivalent of *Thelma And Louise*, only rather more macho. As you proceed from section to section, evading the police (who are after you for a murder you didn't commit) and trying to catch up with your gang (who are being led into an ambush by the evil businessman Ripburger), you're never sure where the long, winding road is going to take you next – to a new town, perhaps, or through a huge canyon. An air of breezy open-endedness is therefore assured, and is a

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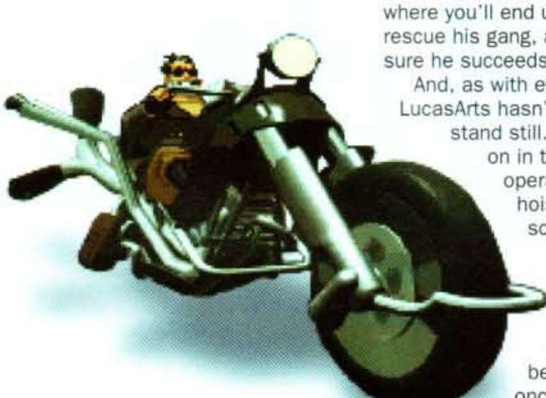
testscreen

Sounds good

The dialogue can often let down talkie adventures horribly, but *Full Throttle* suffers no such problems. LucasArts has employed 12 professional actors (including, as with most games these days, Mark Hamill) to provide the voices for the game's 40 characters. And the results are splendid, combining perfectly with the animation to create really memorable personalities like Ripburger, the oily executive, and Maureen, the tomboy love interest. Just as well, really – with over 2500 lines of dialogue, the slightest hitch with the lip-synch could really begin to grate.



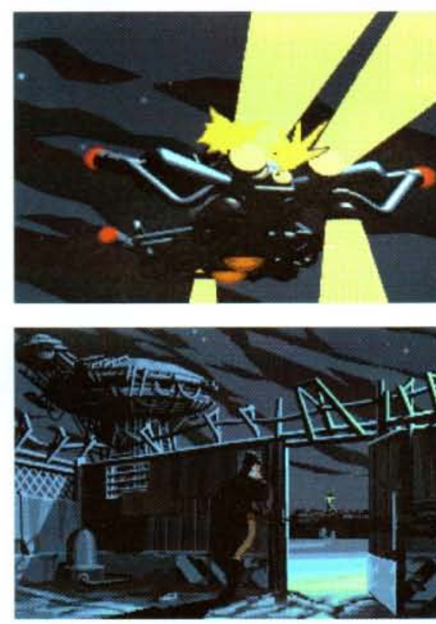
The action scenes (above) work well but they're more a case of having the right weapon to clobber your opponent with. One moment Ben's reading a noticeboard (right), the next he's crashing his bike (top)



further incentive for you to keep going to see where you'll end up. Ben really wants to rescue his gang, and you really want to make sure he succeeds.

And, as with everything else in the game, LucasArts hasn't let the design of its puzzles stand still. There's a great section early on in the proceedings where you operate a magnetic crane, hoisting cars around a scrapyard to defeat a stubborn guard dog. There's also an infuriating bit with a sliding metal door that won't stay open, the solution to which proves to be maddeningly simple. And once your bike's up and running (accompanied by some fantastic close-ups of flames spurting from the multiple exhaust pipes) there are some splendid 3D chases, where you've got to acquire weapons to duff up enemy bikers. You'll frequently be stuck for hours, but the solutions are always (just about) logical, and the rewards justify your efforts completely.

It's good to see that, whatever happened with *Rebel Assault* and *Dark Forces*, LucasArts can still move the goalposts with each new adventure game it produces. *Full Throttle* is friendly, intelligent, funny and completely absorbing. And it proves that CD-ROM can, if approached thoughtfully, provide a PC game with real guts, rather than just a layer of surface gloss.



Ben's presence at an enemy base doesn't go unnoticed (top), and he hastily departs (above)

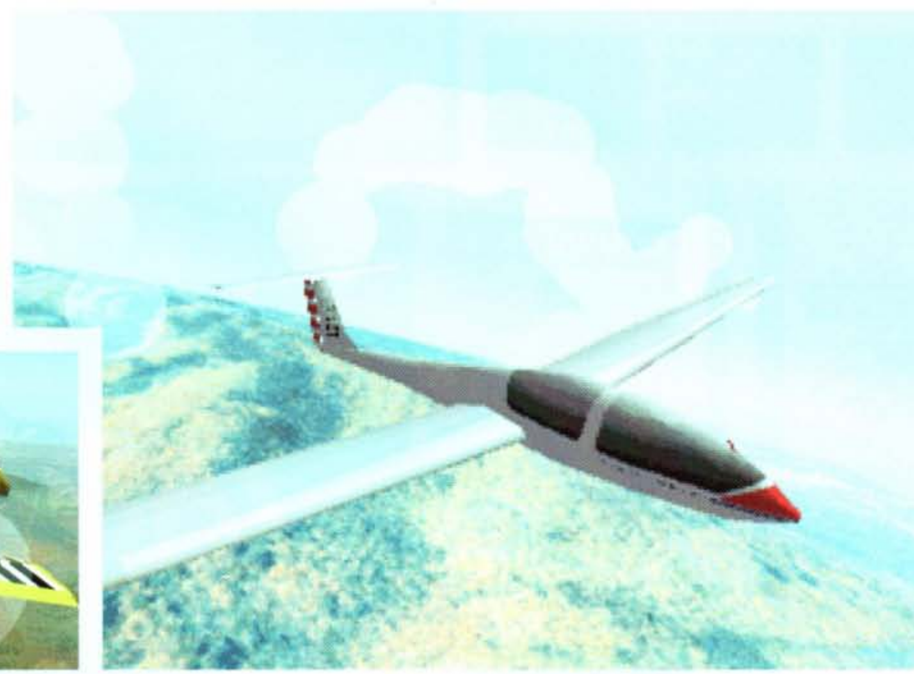


Your enemies stall your progress again by blowing up this bridge. Look on the bright side, though: if you'd arrived a moment earlier, you'd have been plummeting into the canyon too

Edge rating: **Nine** out of **ten**

Flight Unlimited

Format:	PC CD-ROM
Publisher:	Virgin
Developer:	Looking Glass Technology
Price:	£45
Release:	Out now





As well as offering a range of powered aircraft, *Flight Unlimited* initiates you into the joys of surfing thermals in a glider (above). The principles may be similar, but a whole new range of skills is required

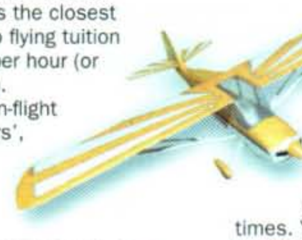




Flying upside down, especially when perilously close to the ground, is not recommended (top). A wide range of landscapes is on offer (above and middle)

The question just begs to be asked: if a flight simulator is written and designed to be completely realistic, based upon the working knowledge of a man who's not only a physics expert but also a qualified light-aircraft pilot, how can anyone expect mere mortals like us to get to grips with the thing? With flying lessons? Indeed. Because *Flight Unlimited* is the closest thing you're going to get to flying tuition without forking out £100 per hour (or whatever the going rate is).

From the moment the in-flight tutor declares, 'She's yours', you can't help but feel that should you ever be in the position where you've got to guide a plane through basic manoeuvres such as a right-rudder turn or a banking left, this is just what it's going to be like. Except, maybe, without the adrenaline-induced hand-wobble.



You're led gently in. There's no point expecting you to be able to get one of the five available light aircraft up in the air, around a couple of mountains and back down again within your first hour. Instead, you start in the air, easing the plane around gentle turns and slow dives, getting accustomed to the controls in a series of simple lessons designed to familiarise you with what it actually feels like to be airborne.

Later, you're offered advanced tuition in runway procedure, stunts and landing, each of which can quite easily take months to master. The simulation is so exacting that it's inevitably unforgiving, and yet it's never frustrating because the beauty of the graphics engine captivates at all times. You don't care if you've just had to hit the TAB key for the eleventh time in succession to activate the 'Miracle' option and bring yourself back from the brink, because even flying around over the same terrain again and again is a rewarding experience in itself.





The virtual cockpit allows you to pan your view through the full 360 degrees. This means that you can bask in the glory of the ground detail while still keeping an eye on the dials

Soaring 15,000 feet above the ground, over field and forest, is an exhilarating experience. The tricky bit is getting down again and living to tell the tale



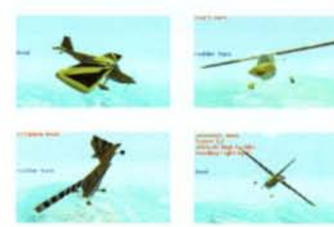
Selecting the external view lets you see exactly how the aircraft responds to your actions

Because it's the graphical splendour of what is undeniably the most polished flight sim to date that lifts *Flight Unlimited* above the Microsoft-created crowd. Actual aerial photographs have been texture mapped on to the ground so that the scenery looks completely realistic, and with the option of bumping the resolution up to a maximum of 1024 by 768, the view from the skies is truly breathtaking. But let's not get carried away here – hardly any of you are ever going to get to experience this ultimate in graphical thrills. Unplayable on a DX2/66, even in the lowest 320 by 200 resolution, barely passable at 400 by 320 on a DX4/100 with a not-unreasonable 16Mb of RAM and a Diamond Stealth 64 video card, and only just what you could call adequately fast on a monster-configured P90, *Flight Unlimited* is, it has to be said, probably the most demanding piece of commercial software available for the PC to date.

But the power you need to get the most out of *Flight Unlimited* is nothing compared to the skill required to become a master at it. Able joystick control and many hours of concentration are necessary just to get through the first five basic lessons, and that's with the flight instructor constantly whining in your ear. Once you're left on your own and you get to take solo flights, it's time to discover what you, and the planes, can actually do. And as you discover it, so does *Flight Unlimited*, because the artificial intelligence engine monitors what kind of a pilot you are, in terms of the stunts you try to pull and so on, and then adjusts the flight engine so that you get the most out of the simulation. When you're good enough at stunt flying you may wish to go in for a little bit of competition in the Hoops Game – a section reminiscent of Mindscape's *Evasive Action*. This requires daring flying and is the one part of the simulator which really gets the blood pressure up and where you're asked to do more than simply admire the view.

Flight Unlimited is a work of art, both in a graphical sense and in terms of the simulation. It maintains a realistic feel throughout, yet it's actually fun too (which is more than can be said of most flight sims), with an engaging atmosphere and a high level of playability. Even though you don't actually get to shoot anything, it never lacks in appeal and diversity. E

Edge rating: **Nine** out of **ten**



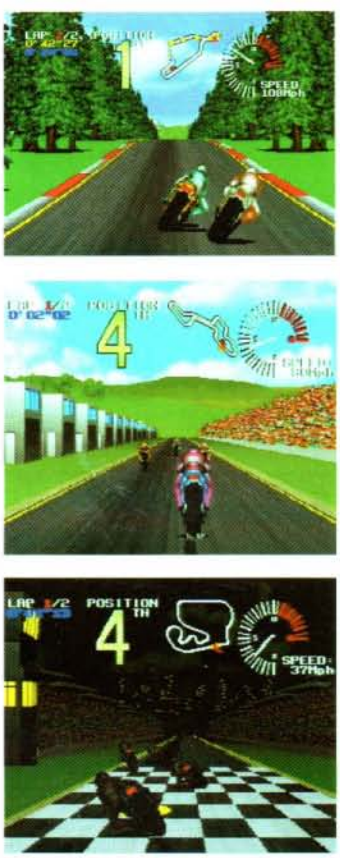




Decisions, decisions... The huge array of options, ranging from which plane to fly, through which lessons to learn, to which flavour of soda you're going to drink at the end of it all, makes *Flight Unlimited* a somewhat bewildering undertaking at first. However, there are a number of useful training sessions to help you through this troublesome initial period

Burn Out

Format:	Jaguar
Publisher:	Atari
Developer:	Virtual Xperience
Price:	£50
Release:	July



Top to bottom: the tracks undulate convincingly; some roadside objects, like these grey buildings, are made up of extremely basic polygons; your headlamp switches on for the night-time tracks, although to little practical effect



Close action with other bikes is rare – number of opponents has been sacrificed for track speed



With only one rival – your opposite number – racing in head-to-head mode is only mild fun

Following the disastrous performances of polygon racing games *Club Drive* and *Chequered Flag*, it comes as little surprise that the latest Jaguar racer, *Burn Out*, has adopted traditional scaled sprites to portray its motorcycle action.

The chief advantage of this is speed. With the throttle opened up to max, *Burn Out* fairly screams along, with a smoothness that at least matches the standard set by Sega's sprite-based coin-ops. However, the objects it's shifting are less impressive: the bikes are ill-proportioned, the track layouts are clinical, and the game has a generally crude appearance throughout. The result is that *Burn Out* – like several of its Jaguar peers – looks almost like a 16bit game in places.

Sadly, it fails to match the playability of many 16bit racers. Control is refreshingly responsive, but only seven other bikes compete in oneplayer mode, making for little excitement, and there are none at all with two players. Compared to the aged SNES game *Top Gear*, which created a real competitive environment by swamping the track with vehicles, it's a diluted racing experience.

Technically, *Burn Out* shows what the Jaguar can do. If Virtual Xperience can get some gameplay into its next release, it could become a name to watch.

Edge rating: **Four** out of **ten**

Slam 'n' Jam





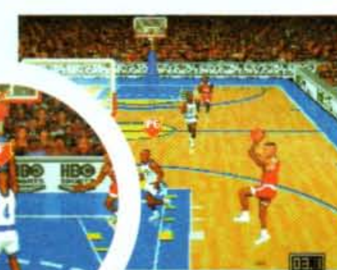
The 3DO has no trouble moving and scaling these eight player sprites simultaneously

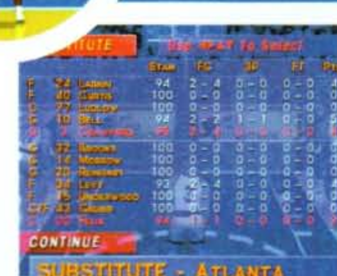
Sampled sports commentator clichés accompany slam dunks (above)



Format:	3DO
Publisher:	BMG
Developer:	Crystal Dynamics
Price:	£45
Release:	Out now







At the end of a quarter, try a long shot for three points (top). It's too late to block this shot (middle). The game offers a wealth of substitution stats (bottom)

Considering the marketing muscle and programming effort devoted to *Gex* (**Edge** 21), you'd have thought that it was a vastly superior game to everything else in the Crystal Dynamics release schedule. But *Slam 'n' Jam* proves otherwise.

The game adopts a totally new approach in terms of camera angles. Whereas *NBA Jam* used a scrolling sidecam and *World Basketball* employed a swirling stadium camera, unlike those SNES basketball titles Crystal has opted for a zooming end-on view. And the result is surprisingly good. The transparent backboards mean that the view is never obscured, and the scaling bitmaps work well.

Complementing the useful views are the excellent controls. Although only three buttons are used, they vary depending on whether the player is attacking or defending, and lend themselves to whatever actions are required.

However, as with most sports games, *Slam 'n' Jam*'s strength is its twoplayer mode – the ability to thrash your friends adds significantly to the experience. The oneplayer mode is enjoyable enough, and the vast number of definable parameters (control modes, statistics, game types, etc) aids the game's longevity, but the lack of an immediate human threat reduces the fun.

Slam 'n' Jam is a well-balanced package with constant fast action, easy-to-master yet hard-to-perfect controls, and a wealth of playing options. It's a good taster for Crystal Dynamics' forthcoming officially licensed sports series.

Edge rating: **Seven** out of **ten**

Arcade platformers didn't come more any more simple – or more playable – than Taito's classic bubble-bursting extravaganza

Bubble Bobble



If you hung around for too long, Baron Von Blubba appeared, homing in for the kill

In 1987, when Taito unleashed *Bubble Bobble* on the world, longevity was far from being a major concern of coin-op manufacturers. But this was a game that rejected the short-lifespan, quick-returns policy of the day, to the extent that even today it can be found lingering in various seaside arcades.

Bubble Bobble's success can be attributed to three main factors. First, its simple and original gameplan ensured immediate playability for anyone drawn in by the cuteness of its central characters, the dinosaurs Bub and Bob. The player had to shoot bubbles to envelop baddies, while negotiating the progressively complex platform architecture of the 100 static screens – each of which demanded different tactics.

The game's simultaneous twoplayer mode was the second way in which it scored over straight platform titles. Like Atari's *Gauntlet*, playing *Bubble Bobble* was a sociable experience, encouraging real teamwork from participants. And, most importantly, character control was tuned to near perfection.

Finally, bonuses and secrets were available by the sackful. Most common were power-ups like speed-boosting trainers and bubble enhancement icons, but there were also hidden techniques to enhance fruit awards plus an infamously elusive secret screen.

Many games – like Toaplan's *Super Snow Bros* – attempted to copy the agenda set by *Bubble Bobble*, but none ever quite achieved its addictiveness and level of playability. The game has recently enjoyed another sequel, *Bubble Symphony*, using similar play mechanics, which ensures that the Bub and Bob phenomenon lives on.

Formats:	Arcade, Amiga, ST (version shown), 8bits
Manufacturer:	Taito
Publisher:	Firebird
Developer:	In-house
Released:	Early 1987 (arcade)

Edge invites contributions to Retroview. Entries must be in Edge style and approximately 250 words long. Published contributions will win their sender a year's subscription to the magazine. Address: Retroview, Edge, 30 Monmouth Street, Bath BA1 2BW. Fax: 01225 338236. E-mail: edge@futurenet.co.uk.





Bonus bubbles, like this water-filled affair, presented Bub and Bob with various special effects (top). Just one touch was required to burst this entire collection of bubbles (above)



Sometimes you had to to jump on bubbles in order to access the upper reaches of the screen





The reward for collecting all the letter icons was an extra life (top). The game was peppered with Taito's brand of self-referentialism (above)



Photographs: Jude Edginton

John Edelson

3DO's prognosis has improved somewhat recently, thanks to news of M2 and increased hardware support from the likes of Sanyo and Goldstar. As the company prepares to face Sega and Sony head-on, **Edge** asks one of its top execs what the future holds

John Edelson has arrived in England as sales and marketing director of 3DO Europe, but, given his somewhat peripatetic route, he might easily be here in a completely different role. After graduating from college, he spent two years in the Peace Corps in Cameroon, West Africa. He returned to attend Harvard Business School and then set out again, this time to Paris to become a strategy consultant for French multinationals. After a while, like most people, he decided that he didn't want to work with the French and didn't want to be a consultant. So he quit and went to Silicon Valley in search of the California dream.

As a child, John lived in London for three years. He'd never have guessed he would return to direct the fortunes of 3DO. **Edge** spoke to him at 3DO's new office in sun-kissed Richmond, nestling on the banks of the Thames.

Edge How did you get into the videogames business?

John Edelson I was calling up friends looking for a job and I stumbled across a company which I'd never heard of, and none of my friends had heard of, called Silicon Graphics. This is in 1989. They were looking for a product manager in the software division. After about ten minutes of the interview the guy turns to me and says: 'So you don't really know what a compiler is. And you don't know anything about UNIX Protocol Sac for communications.' 'I'm a fast learner,' I said. The next day they phoned me up and offered me a job.

Edge What was Silicon Graphics working on at the time?

JE There was a dream there that some day they would have realtime graphics. Initially that was done as remote graphics terminals. Then it was done with workstations. It was their goal to bring in a machine at under 20,000 dollars. Their first project delivered an 80,000-dollar computer to the market and almost took the company out of business. Then they brought out the personal Iris. Then it was the Indigo and that I played a key role in. This was going to be a realistic tool for a lot of people. I was in charge of getting

software. The biggest deal I did was with Autodesk to get *Autocad*. We also worked with Alias.

Edge Was SGI even thinking about games at this time?

JE At the end of the Indigo project in 1992 I was trying to get them interested in the multimedia realtime business. If you go to the CES, to the Nintendo tent, there's this big realtime Mario that talks to you. It's pretty damn cool. Nintendo's involvement was really driven by an engineering firm in Los Angeles called Sim Graphics, but they needed one more computer and that was the Onyx. That was one of my deals. It was a big hit except at SGI, where no-one seemed to give a damn.

Edge Why did you leave SGI?

JE In the summer of 1992 some of the multimedia engineers had left Silicon Graphics and gone to a little startup called SMSG [San Mateo Software Group]. Next thing I knew, I'd been recruited to get software. And that's how I ended up at SMSG, which was the codename for 3DO before it was born.

We changed the industry. All the current competition is between people who have done 3DO lookalike products... 3DO is the revolution

Edge What's the difference between working at SGI and at 3DO?

JE It's pretty much the same. Hi-tech company, people really excited about being there, coming in a little too early in the morning, staying far too late at night. Passionate about the work. Absurdly ambitious. Both have longterm visions. Some times we'll be in style, sometimes not, but in either case it's a damn exciting place to be. Neither one is heavily corporate. I left SGI because it just got so big.

Edge Ironic then that, in effect, your goal is to make 3DO so big that you'll have to leave it too...

JE Life is full of little ironies, isn't it? No, the beauty of 3DO is that because so much of our business is done through thirdparties and licensing, we can stay smaller. We never need a factory or a warehouse. Most of the mundane functions we can avoid, particularly over here where there's just so few of us. It's back to being very entrepreneurial.

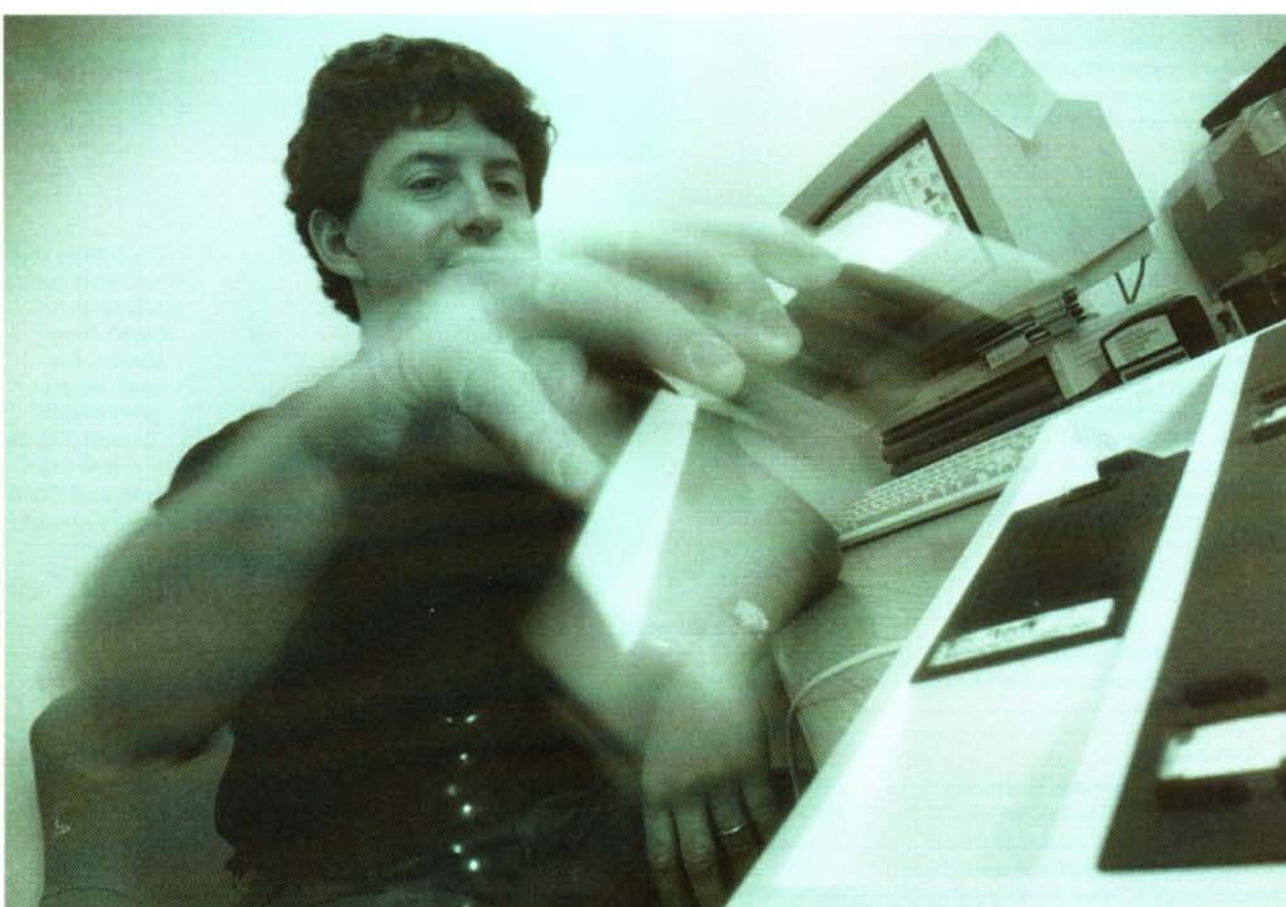
Edge At the time of SMSG, the 3DO was a unique product. It must have been especially exciting then.

JE It was. By the time 3DO hit the street we already had 100 developers signed up, which entirely changed people's perceptions of the rollout. As usual, the software was late and the marketing wasn't quite together, but we changed the industry. All the current competition is between other people who have done 3DO lookalike products.

Edge They may look the same but some of your competitors have significantly more advanced hardware. You hit the beach first, but do you now feel like a casualty of war?

JE 3DO was formed to create a standard and reform the industry. Until a year ago, Tom Kalinske from Sega was still saying, 'A

Continued next page



interview

system like 3DO? We'll never do it. There's no market for it.' We proved that there was. 3DO is the breakthrough. 3DO is the revolution.

Edge But as the Saturn and Playstation step into the spotlight, don't you feel a martyr to the cause?

JE They have a certain appeal right now and we've seen this in Japan. At the end of the day it's who's got the most momentum, who's been most profitable. 3DO has a lot of advantages which will carry the day.

Edge Which are?

JE Of the three systems, 3DO costs the least to manufacture. In Japan, Sony have made a big deal out of the fact that their machine is cheaper at retail. We have a higher suggested retail price but a lower street price.

Edge What about the USA and Europe?

JE I don't know. Sony and Sega both made a big deal out of the fact that their machines were cheaper to manufacture because they used off-the-shelf components. It's true that this means an easier rollout and a lower startup cost. But unlike us, Sony and Sega have to call up their vendors and say, 'Hello, Mr Vendor, we would like to involve you in a programme to build volume and reduce cost.' The guy says, 'Ah, you'd like me to be involved in your cost-reduction programme because you've designed a system around my chips? Gotcha!'

Edge Maybe they'll be willing to swallow that cost as long as they sell enough units?

JE Which is the bigger company, Matsushita or Sony? Matsushita. I wonder if they're really on top of the fact that they're in for a war. I would guess that they've sold their management on the fact that this will be a quick hit and the war's over. Many people have predicted that Sony will be out in 36 months. I don't think they have a longterm plan. I think the whole thing's based on a big rollout. It's a war and this fall we'll do fine. We have a large and loyal cadre of customers who are eager to evangelise it to their friends.

Edge Is there not some disappointment as well? Without Crystal Dynamics there would have been a definite dearth of 3DO-specific software.

JE None of the ten top-selling titles in Europe for 3DO have come from Crystal.

Edge Maybe people just don't like their products much. But leaving Crystal aside, there's still a lack of new titles.

JE This is an ancient beast. Everybody always wants more. The real question is this fall. There's some number of people who are willing to go to the shops and buy advanced systems. What are they going to buy? They'll find a 3DO with maybe 150 titles. Three advanced systems may be too many. Sony's a little bit stronger over here, but how many titles will they have? Software tends to be late. It's hard to get the PAL stuff done. I don't know. And by then M2 will be flashing around, although it doesn't really ship in volume till next year. Plus, the fact that there are people doing third- and fourth-generation titles on 3DO that make the system look better than stuff you'll see elsewhere. There are developers that will tell you there's stuff they can do on 3DO which they can't on other systems.



Edge With regard to M2, it must be difficult enough, with all these systems jostling for ascendancy, to gain the allegiance of thirdparty developers for M1, let alone for yet another product.

JE I've talked to developers for a trillion years now, and the fact is they never have enough time to do a dog, but they've always got the energy for something they think is a good investment. Our indication with M2 is that they are queuing up willing to compete and invest in getting a hold of development systems.



Edge With 3DO's well-documented problems in the US, how important is the UK and Europe for sales and development?

JE In the US things are going unbelievably well right now. At Christmas we went shooting through 200,000 systems. Things are going great here in the UK. We're in Virgin, HMV, Future Zone. They're making a lot of money out of us. In France the grey market is very strong. If you're into Micromania or FNAC – their version of Dixons – you'll find 3DO stocked. EA sold 7,000 *FIFAs* into France. Not bad as a running start. And Goldstar launches there in June. Panasonic will be rolling out in Germany soon, which is the biggest European market. I'd like to see **Edge** and its readers have a little more enthusiasm for the revolution that's going on.

Edge Why do you believe the magazine isn't enthusiastic?

JE Because it's reported on like a horse race. The bulk of the reporting is who's out in front, when the exciting thing is really how much better the games are.

Edge Talking of games, what about a Studio 3DO here in Europe? Do you have any plans?



JE If Trip's gonna read this I'd better not say yes, because he doesn't know about it. But yeah, we got plans here in England. There's so much talent in England that it can't be ignored. In fact, we're already working with Krysalis.

Edge As an ex-Silicon Graphics man, you must be more than a little interested in the Ultra 64 collaboration.

JE First of all, the irony there is that those of us at Silicon Graphics who were really interested in the games industry never had any success at the company. Both the Sony deal and the Ultra 64 deal came from a bunch of chip nerds in the MIPS project who went and sold silicon technology to



them. Not existing silicon technology but the ability to design new chips. Ultra 64 is aiming at a different market and using a dramatically different technology to us. It's a cartridge system. How will it do? In terms of its price it's got to be a winner. It's got no CD drive. That's the most expensive part of a system. I don't know if it's a winner in terms of being a decent opportunity for publishers. Cartridges are damned expensive. So, is there any margin for the publisher? I don't think so. People who need CDs are not the people who buy games but the publishers. I don't know any publishers who are interested in Ultra 64.

Sony will be out in 36 months. I don't think they have a longterm plan. I think the whole thing's based on a big rollout. It's a war and this fall we'll do fine

Edge You say Nintendo is aiming for a different market – a games market – but although 3DO originally positioned itself as a multimedia machine we've seen nothing but games so far.

JE It's a question we keep asking and testing the waters on. The early-adopter market is pretty games focused. In fact, they'd like it to be games only because it feels cool in a way a broader machine doesn't. Does this change as you get out into a mass market? In the United States we have some evidence that this is the case. We are selling more multimedia stuff now – not just in an absolute sense but in a relative sense – than at the beginning.

Edge What's the most important task for 3DO now?

JE To continue to deliver innovation and quality to the customers, and to stay one step ahead of the other players. So far so good.



Send your **questions** to Q&A, **Edge**, 30 Monmouth Street, Bath, Avon BA1 2BW

Q 1. Will any of the following games be making an appearance on the PlayStation: *Final Lap R*, *Bomberman*, *Doom*, *Nebulas Ray*, *Suzuka 8 Hours* and any golf or tennis titles?
2. Will Namco be revamping any of its old classics (*Galaga*, *Dig Dug*, *Rolling Thunder*, etc), maybe on a compilation disc?
3. How much will official games be priced at?
4. When the PlayStation 2 comes out (whenever that may be), what will happen to the existing model? Will it be compatible? If the same thing happens as with the Neo-Geo CD, there will be a lot of people who will be very unhappy with Sony.

Mark Woolford, Yeadon, Leeds

A 1. Namco is concentrating on polygon-based titles rather than sprite-based ones for its current PlayStation line-up, so don't bank on *Final Lap R* or *Suzuka 8 Hours* appearing, although *Nebulas Ray* could conceivably turn up in some form (see answer to question **2**). Id Software is yet to sign up as a developer for the machine, but a version of *Doom* seems a dead cert to appear at some point, albeit in an updated form. Hudson is signed but has yet to announce a *Bomberman* title – it may appear following the arrival of the proposed multitap for the machine. Tonkin House's *V-Tennis*, featured briefly last month, looks very promising, while no golf games have yet been announced.
2. Namco is actually planning to release a compilation CD featuring PlayStation versions of many of its old classic coin-ops. Games likely to appear include *Galaxians*, *Galaga*, *Gaplus* and doubtless a few *Pac Man* titles. This could, of course, account for the fact that only mere snatches of two of the aforementioned games appear during the loading sections of *Ridge Racer* and *Tekken*.
3. Prices will vary slightly from title to title, and the jury is still out on the final rate per unit. An average game looks set to clock in at £40-45, although Sony's own games could undercut the prices of some thirdparty titles.
4. Backward compatibility is obviously a very consumer-friendly consideration, and Sony will have to take it into account if it is to maintain its claimed high level of customer care.



Will *Galaga* be appearing on the PlayStation? (See letter from Mark Woolford)

Q In previous issues, I have noticed that some of your technical language has remained unexplained. I understand the majority of what you talk about, but I do have some queries:
1. What does SRAM, VRAM and DRAM stand for, and what are their respective purposes? I know that RAM is Random Access Memory but am unsure about the various prefixes used.
2. There has been a lot of talk about anti-aliasing being used in the super-consoles. What does this term mean?

Paul W Thomas, Australia

A 1. In ascending order of speed of access: SRAM is Static RAM – memory used for saving game positions in games carts, for example; VRAM is Video RAM – memory allocated specifically to holding graphics processing data; and DRAM is Dynamic RAM – what is most commonly referred to simply as RAM, ie onboard general-use storage space.
2. Anti-aliasing is a process which smoothes out the jagged edges of graphics by using pixels which are midway between the background and foreground colours. The simplest way to understand it is to imagine a plain black polygon on a plain white background; by inserting grey pixels between the black pixels at the edge of the polygon, you reduce the contrast between the white and the black, and the shape appears to have softer edges.

Q 1. The Jaguar CD player can play ordinary music CDs, but do you have to hook it up to a hi-fi system or does the music come straight from your TV?
2. The machine can also handle PhotoCDs. Do you need any special cables for this or will you just require the standard cable the Jaguar comes packaged with?

Lee Chapman, Melton Mowbray

A 1. The Jaguar sends CD music through the TV speakers as standard.
2. Although the Jaguar hardware has the capability to handle PhotoCDs, Kodak (the company which created the format and was responsible for the Falcon's PhotoCD software) has yet to develop the software to cover such tasks. At present, the Jaguar is aimed squarely at the games market, and multimedia applications such as PhotoCD won't come into focus until the machine and its market matures.



***Ace Driver* shows how anti-aliasing can be used to good effect (see Paul Thomas' letter)**

Q 1. As Namco is signed up with 3DO as well as Sony (for the PlayStation), does it have any plans to convert *Ridge Racer* (and *Ridge Racer 2*) or *Ace Driver* for the M2 upgrade?
2. I have heard that the PlayStation's CD drive is triple-speed. Is this true?
3. How much RAM would the basic 3DO unit and M2 have combined?
4. When will *Doom 2* and *Magic Carpet* be appearing on the 3DO?

Jason Aubrey, Hinckley

A 1. *Starblade* is the only Namco 3DO product in the pipeline so far, and the company had revealed no plans for future titles.
2. No, it's a double-speed drive.
3. Seven megabytes in theory – three shared with the base 3DO unit and four in M2. However, with such a large amount dedicated to the upgrade module it's possible that the married units will only be able to access M2-specific RAM.
4. The 3DO version of *Doom* is due in May, and *Doom 2* should be out in September. However, a conversion of *Magic Carpet* for the system has yet to be undertaken.

Q and A

You can rely on Edge to cut through the technobabble and give you straight answers. Write to: Q&A, Edge magazine, 30 Monmouth Street, Bath, Avon BA1 2BW. Alternatively, fax us on 0225 338236, or e-mail us at edge@futurenet.co.uk.

Edge regrets that it can't answer questions personally, by phone, post or e-mail.

next month



SCE's stylish new PlayStation shoot 'em up, *Philosoma*. Only in **Edge** 23

Next issue, **Edge** reports from the interactive entertainment event of the year, the Electronic Entertainment Expo (E^3) in Los Angeles. This is the big one: not only will a huge array of new titles for both Sony's and Sega's new consoles be on display, but Nintendo will finally showcase the Ultra 64 and its software, and 3DO will be making M2 a commercial reality.

Also in issue 23: an exploration of the field of motion capture and the technology used to create the world's best character animation. In New York, **Edge** scrutinises Acclaim's proprietary technology – used for special effects in *Batman Forever* and forthcoming games – and details the techniques employed by the leading videogame animators

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